WORLD PETROLEUM

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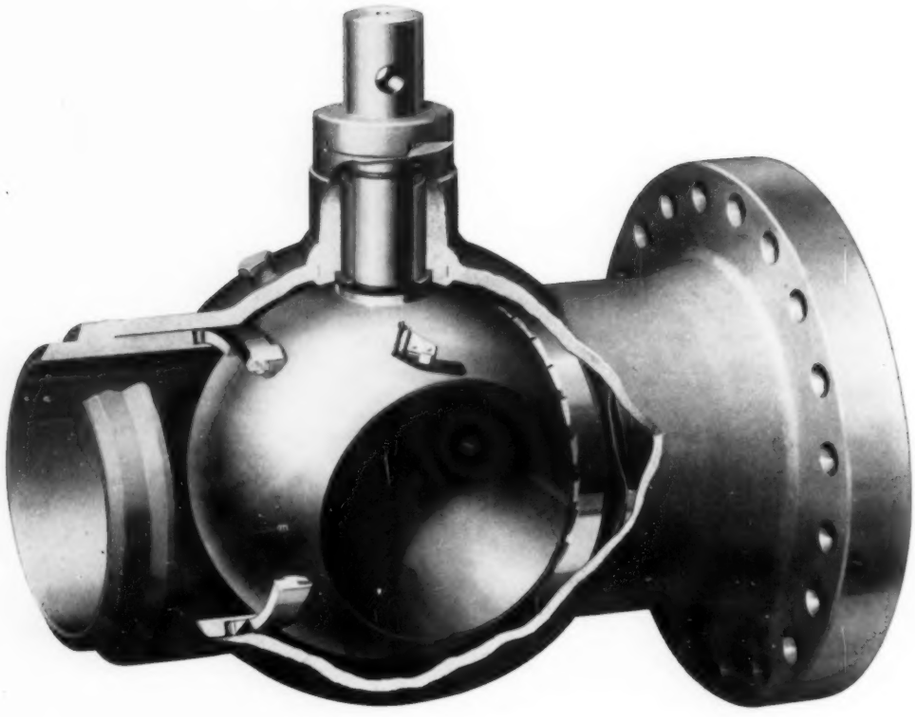

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THE MANAGEMENT PUBLICATION OF THE INTERNATIONAL PETROLEUM INDUSTRY

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THIS MONTH'S COVER

Oil painting by Nicola Simbari depicts oil installations on Venezuela's Lake Maracaibo. His imaginative work is reproduced here courtesy of El Farol, company magazine for Creole Petroleum Corp., affiliate of Standard Oil Co. (New Jersey) in Venezuela.

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by Joseph B. Huttlinger

Kennedy and Oil

The election of Kennedy last Nov. 8 promises changes for business, labor, individuals and for relations between the U.S. and the rest of the world. The oil and gas industry is no exception.

The first changes will come in the parade of new faces coming to Washington to take over top jobs. A brand new Cabinet is in the making and hundreds of sub-Cabinet jobs are to be filled.

Oil men will watch with particular interest choices for Secretary of the Interior, of State and Defense and for Attorney General.

Down the line, the President has the power to name a new director of the Office of Oil and Gas and Oil Import Administrator at the Department of the Interior.

Kennedy also will be able to name two men to the Federal Power Commission, and to name one of them as chairman. The FPC has life and death power over the natural gas and electric industries. Kennedy could name William R. Connole as chairman. Mr. Connole was named by President Eisenhower, and then dropped at reappointment time.

The second changes will show up in the messages of the new President to Congress in the coming months. The budget to go to Congress in January will be Mr. Eisenhower's "caretaker" budget, so it is no tipoff to the thinking of the new President. Chances are that Kennedy now will ask for extra money for defense, public works and for other things.

The election brings a change in control at only one of the three main branches of government. The House of Representatives and the U.S. Senate continue under control of the Democrats, and most of the key figures in Congress were returned by the voters. Also returned were most of the foes of oil, such as Sen. John J. Williams, R., Del.; Sen. William Proxmire, D., Wisc., and Sen. Paul Douglas, D., Ill.

Friends sent back include Rep. Oren Harris, D., Ark., chairman of the House Interstate and Foreign Commerce committee, and Rep. Wilbur Mills, D., Ark., chairman of the powerful House Ways and Means committee. All tax bills must originate in the Mills committee.

Also back will be Rep. Eugene J. Keogh, D., N.Y., and Rep. Frank Ikard, D., Texas, two friends of oil and gas on the ways and means committee.

The third part of government, the judiciary, is filled with persons named for life, so the election meant little change there. But in the next four years, at least, any vacant judgeships will be filled by Democrats.

The oil and gas industry is most concerned, perhaps, with three or four specific issues as it studies the meaning of the election. These include the fate of the 27.5% income tax depletion allowance for crude oil and natural gas production, the chances for passage of a natural gas bill and the outlook for the oil import program.

As to each of these issues, the coming of Kennedy does not promise much help to the industry. Both Mr. Eisenhower and the rival candidate, Richard M. Nixon, vice president for the past eight years, offered more.

Kennedy has voted to slash the depletion allowance on a sliding scale to 15% for operators with gross incomes of $5 million or more. He voted against a flat cut to 15%. He voted against a natural gas bill. As to oil imports, he leans toward plentiful imports, although he has never given his views in detail. If imports hurt a U.S. industry, he is in favor of government loans or other aid.

These three issues should be considered in some detail.

Kennedy ran on a platform promising to "close the loopholes" in the tax laws and naming depletion as a "more conspicuous" loophole. The platform did not use the word oil when it spoke of depletion, and Kennedy has tried to say it does not mean oil or gas.

During the campaign, Kennedy shifted over to call for "a study in detail" of all depletion allowances to see if they should be raised or lowered. He added, "perhaps oil abroad should be treated differently than oil here at home."

In contrast, Eisenhower and Nixon had held that the present rate of oil

Pipeline

depletion is "about right." A parallel tax provision, of equal importance to oil and gas producers, is the right to treat drilling costs as expenses to be deducted in a single year. Kennedy has yet to give his views on this.

Kennedy voted against a bill to ease up price and other federal controls over independent producers of natural gas in 1956. And he was silent about this during the campaign. This is the bill that Mr. Eisenhower asked for three times and then vetoed due to "arrogant lobbying" when it reached him. There are only slim grounds to expect Kennedy to take the lead for passage of a new gas bill; there is a question whether he would sign one if it reached him.

Kennedy is a free trader, and there is nothing to indicate that he is in favor of the oil import program. However, he would bring an uproar if he tried to end it overnight. In fact, persons fully expect and believe that he will continue it at least until 1962 when Congress is to consider the matter as it takes up extension of the Reciprocal Trade Agreements program. This is the overall authority for the oil import program.

It is only fact to point out, however, that Kennedy, as President, could end the import curbs by a stroke of the pen. He could raise or lower the total of allowed imports to any level he sees fit. And, he has the authority to make virtually any changes he sees fit.

Friends of Kennedy have been pointing out in the past few months that he has come to see the light, and now understands oil and gas problems better. So, they said, he will shape up as a good President as far as oil and gas are concerned.

As a matter of fact, Kennedy is an oil man, himself. One of the best kept secrets of his personal life is that he has a substantial interest in the Mokeen Oil Co., an oil and gas producing firm of Corpus Christi, Texas. This, in fact, may be the first time this information has appeared in print.

The 1959 International Petroleum Register gives the address of the company as 920 Wilson Tower and the officers as J. Modesett a general partner and T. J. Walsh a limited partner. Kennedy is not listed among the key personnel, although Modesett speaks of it as "Kennedy's company."

The alliance of Sen. Lyndon Johnson, D., Texas, with Kennedy has been used by Democrats to argue that the Kennedy-Johnson team will be good for oil. Johnson has led oil's battles in Congress and the White House for years.

Johnson's ability to help oil and gas in the future, just as his eagerness to help, may be a question. Vice Presidents have a way of being stored in a corner. While this could happen to Johnson, it appears more likely that with his temperament and his talent, he will be given a key role in the Kennedy administration, and will be counted upon to get bills through the Congress. Whether Johnson wants to help oil and gas may be even more of a question, as leaders of the industry turned to the Nixon-Lodge ticket in large numbers.

On other matters, Kennedy has sided with the coal forces and against oil and gas by coming out for a national fuels policy, and his support could lead to a study. If the board to make such a study is stacked against oil and gas and in favor of coal, it could bring long-run dangerous results.

Kennedy stands for higher federal taxes on gasoline, if needed to keep the federal highway program on a pay as you go basis. He looks to the gasoline tax as the prime source of revenue for the program. In this, he is little different from Mr. Eisenhower. The tax is now four cents a gallon, but set to drop to three cents next June 30. Many feel that there is as much chance that it will be raised to five cents as dropped to three cents.

Kennedy also wants more government efforts to cut down on air pollution from auto exhausts, for production of oil from oil shale and coal, and a study of the seaward boundaries of the coastal states.

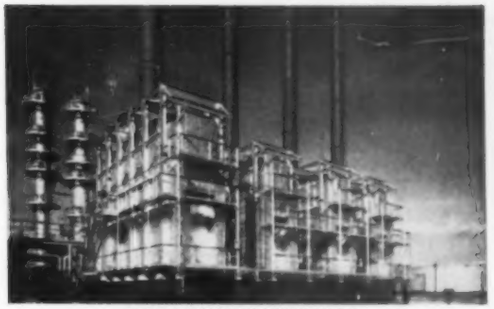
Louisiana hopes for help from Kennedy as it presses a bill to give it, Alabama and Mississippi, title to 10.5 miles into the Gulf of Mexico. This would put these states on a par with Florida and Texas, which received 10.5 miles from the U.S. Supreme Court. In the past, Kennedy voted against giving coastal states even three miles.

Kennedy says he wants to end backdoor influence at the Federal Power Commission, and it remains to be seen whether he will press for legislation to this end.

Kennedy wants tough enforcement of the antitrust laws, a stand also held by Mr. Eisenhower. Thus, Mr. Eisenhower's regime filed suit against 29 oil companies alleging gasoline and crude oil price fixing. The court found the companies innocent.

(*Continued on page 6*)

CRUDE HEATERS, VENEZUELA



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(Continued from page 5)

Kennedy will be in the saddle when the government signs its first contracts with private industry to capture helium from natural gas pipe lines. While Mr. Eisenhower proposed the bill, and Congress passed it in 1960, the bill forbade any signings until March, 1961.

Russian use of oil exports to win friends and destroy free economy in oil are on the rise, but what, if anything, Kennedy can or will do about it is to be seen. Chances are Kennedy will have little sympathy for any subsidy program to help oil firms meet the threat.

Foreign problems for oil loom large in Cuba, Algeria, India, the Middle East, Venezuela and elsewhere. Kennedy is expected to try to play a hands-off role.

. On general matters, Kennedy is for a strong national defense, big foreign aid, higher minimum wage with broader coverage, raising taxes to meet costs but cutting them in a recession, pump-priming by government in a recession, a bill to aid labor unions, cheap money and a five per cent a year growth in the national economy.

Actually, the Kennedy program is little different from that of either Mr. Eisenhower or of Mr. Nixon. The main difference seems to be in degree. Chances are that Kennedy would spend more, tax more, run to deficits, want more persons at work, and allow more inflation. But the general direction toward big government would continue.

While Kennedy's votes in the House and the Senate, the platform of the Democratic Party and Kennedy's campaign speeches indicate the direction ahead, the only real test is what he actually will do. Thus, until the industry sees who he names to top jobs, studies his messages to Congress and the bills he proposes and those he opposes, it is unclear what the Kennedy election will mean.

Summary of Kennedy's Record

1. Voted to cut the depletion allowance on a sliding scale, but against a flat cut to 15%. Now, he wants a study, and indicates foreign production should get different treatment.

2. Voted to kill a natural gas bill to ease federal price and other curbs over producers. He's given no reason to believe he has changed his mind.

3. Voted for free trade, indicating he likes plenty of oil imports, but there's no sign he wants changes in the present oil import program.

4. Backed study of a national fuels policy as asked by coal and fought by oil and gas.

5. Favored pay as you go for highways, even if it means higher gasoline taxes.

6. Favors more government aid to cut down on auto exhaust and other pollution of air and water.

7. Wants to close the backdoor influence at the Federal Power Commission and other government agencies.

8. Favors tough antitrust enforcement.

9. Favors easing curbs on labor union, cheap money, more spending, more welfare, tax cuts in a recession, U.S. spending in a recession, a farm bill.

10. Favors stronger defense, big foreign aid, international cooperation through the United Nations and other agencies, free trade among nations.

Kennedy's Meaning for Oil

The oil and gas industry has little to cheer about with the election of John F. Kennedy, age 43, as President of the United States, but things could be far worse.

US Fuel Oil Stocks Low

Stocks of residual fuel oil in the U.S. stand at the lowest point for this time of the year in a number of years, it is reported by the U.S. Department of the Interior. The total was 24,645,336 barrels at the start of October.

Comparable figures for 1959 are 32,573,500; for 1958 are 36,305,500 and for 1957 are 36,018,883. During the third quarter of this year, the government set allocations for residual imports totaling 23,029,532, and all but 15,289 barrels of this was brought in. Biggest unused quotas lay with Standard Oil Co. (N. J.) which let 9,873 barrels of its quota go unused.

US Refinery Profits Fall

Cash dividends paid by oil refineries fell to $1,060 million in the first nine months of this year from $1,093.3 million a year ago. Dividends in September were $342 million against $355.4 million in September a year ago.

U.S. Department of Commerce made the report. The showing was in contrast to the picture for dividends of all corporations, which rose from $9,318.3 million in the first nine months of last year to $9,809.7 million this year. For all corporations, September dividends, too, were higher this year, $1,965.5 million against $1,917.6 million a year ago.

US to Buy Helium

U.S. Department of the Interior has asked proposals by the end of this year for extraction of helium from natural gas for sale to the government. The government asks persons and firms interested to tell the supply of helium-bearing gas they would draw upon, the life expectancy of the fields, their helium content, the pipe line facilities, the type and efficiency of the proposed extraction plants and the expected helium recovery over a period of years.

The request is a follow-up of Congressional action authorizing the government to negotiate with private industry for steps to save an estimated 52

(Continued on page 90)

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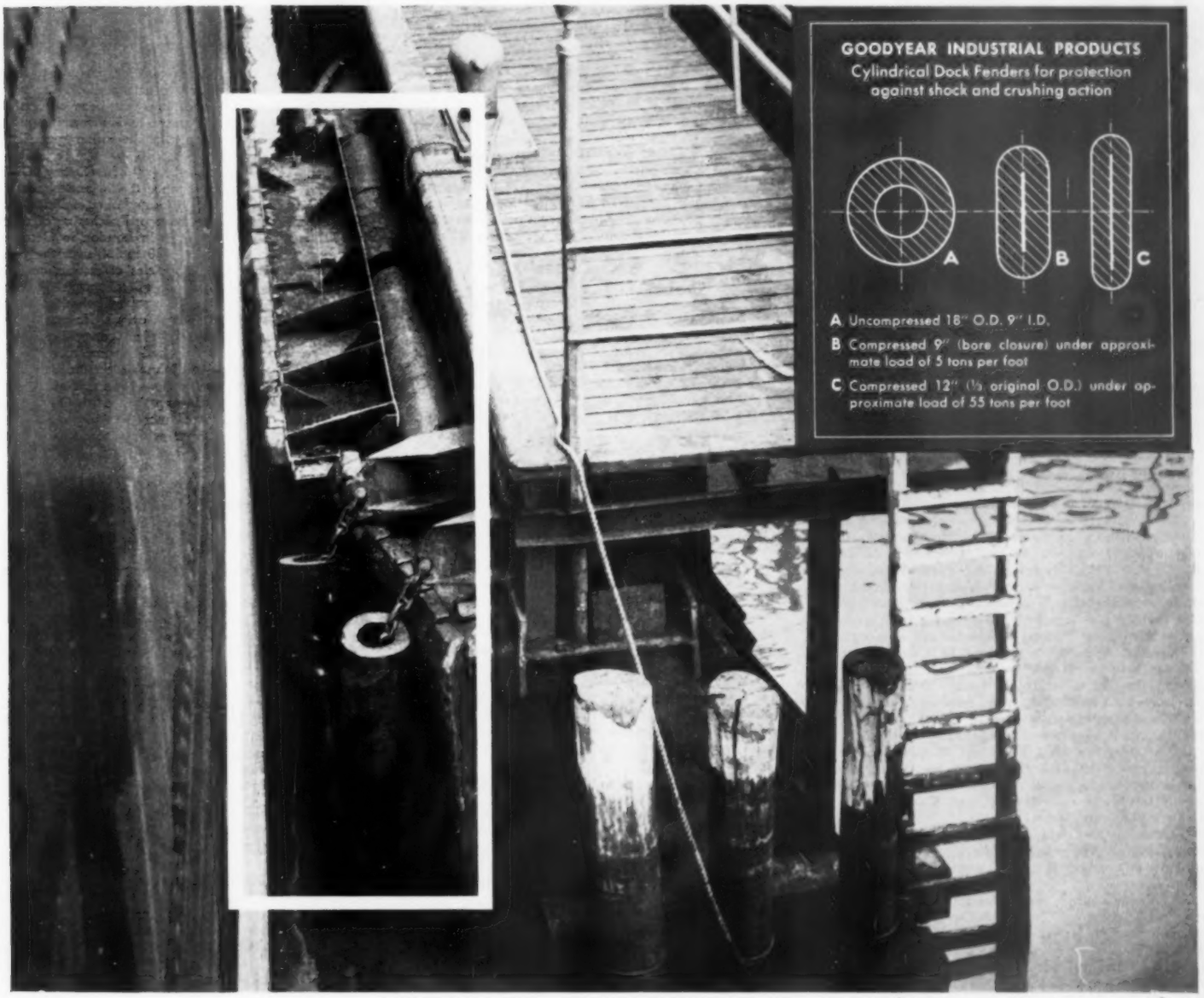
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GOODYEAR

Large-Scale Methane Import Studies

The Gas Council announces that studies are being made of the economic aspects of the large-scale importation of liquefied methane and of possible sources of supply. The Gas Council report for 1959/60, issued recently, says this has been proved "technically possible" by the delivery to the North Thames Gas Board of a number of cargoes in the "Methane Pioneer" and the conversion of the methane in a reforming plant for use for cold enrichment of water gas before distribution to consumers. The cost to the council of these further voyages is given as £312,836, against £93,500 in 1958/59, but otherwise the report continues the policy of extreme secrecy which has characterized this experiment since the start, and no information is given as to the quantity imported or the economics of utilization.

These studies are known to be proceeding in association with Conch International Methane Ltd., the new company representing the participation of The Royal Dutch/Shell group in the work of Constock International Methane Ltd. (Bahamas). According to the chairman of the West Midlands Gas Board, the Gas Council has approved a scheme for presentation to the Minister of Fuel and Power for the importation of liquefied Saharan natural gas by Conch to the Thames Estuary, whence it would be transported by pipeline for use in enriching the gas to be made in the Lurgi coal gasification plant building at Coleshill, near Birmingham, with a capacity in the initial stage of 40 mmcf/d, and due to be operating mid-1963.

It is understood that this West Midlands project incorporates a detailed plan for pipeline construction and automatic control of methane delivery drawn up jointly by Trunk Pipelines Ltd. and Marine Remote Centres Oil Installations, Ltd.

Trunk Pipelines was registered last May to construct, own, manage and operate pipelines, pumping stations, oil loading terminals, storage plant and refineries.

Its directors are: Wm. Wallace, chartered civil engineer (director of Cochran & Co. (Annan) Ltd.); Samuel V. Collins (director of Collins Submarine Pipelines Ltd.); and Fraser L. Martens (director of Close Bros. Ltd.). Nominal capital is £100 in £1 ordinary shares and the latest share allotment is S. V. Collins 45, Wm. Wallace 30 and Close Bros. Ltd. 23.

Mr. Wallace is also a director of Marine Remote Centres Oil Installations, registered in 1956 to act as construction contractors or consultants to projects such as those just mentioned. In addition to Mrs. Wm. Wallace, the other directors are: Thos. L. Bonstow, engineer; R. P. Wyndham Adeane, OBE (director of Cochran & Co. (Annan) Ltd.); and Thos. L. Williams (director of Phillips Telescopic Taps Ltd.).

Nominal capital is £50,000 in £1 ordinary shares, of which 6,502 fully paid (6,500 held by Mr. and Mrs. Wallace) have been issued and 16,000 13s. 4d. paid. The last record shows the latter to be held as follows: T. L. Bonstow, 7,500; Municipal Trust Co. Ltd., 3,000; London & Overseas Investment Co. Ltd., 1,500; New York & General Trust Ltd., 1,500; R. P. Wyndham Adeane, 1,500; and Wm. Wallace, 1,000.

New Petrochemical Venture

British Petroleum Co. and California Chemical Co. (Standard of California subsidiary) announce "BP California," a joint £7 million venture which involves the immediate construction of two plants in Europe to make aromatics. These will be adjacent to the BP refineries at the Isle of Grain (Kent) and at Dinslaken, West Germany, and BP will operate them on behalf of BP California. Contracts for building the former are being negotiated with Badger, Bechtel and Wimpey, and initially the capacities of both plants will be for the annual production of 19,000 tons orthoxylene, 16,000 tons ethyl benzene and 22,000 tons of paraxylene. Initial production is scheduled for late 1961.

BHC South Wales Project

A major expansion of facilities for manufacturing chemicals from petroleum in which initial investment may well be £10 million is planned by British Hydrocarbon Chemicals Ltd. (50:50 British Petroleum and Distillers). This will be on a site of several hundred acres near the BP refinery at Llandarcy in South Wales, but all that is revealed about plans is that the "general pattern of operations can be expected to follow that at Grangemouth." There the company has been actively engaged on a large scale for nearly 10 years in producing chemicals from petroleum which serve as basic materials for other petrochemical manufacturing processes, largely in the nearby plants of other companies.

Terms of BP Offer for Apex

The terms offered by British Petroleum Co. for the £1.1 million capital of Apex (Trinidad) Oilfields Ltd. are £1 of ordinary BP stock plus 4s 6d in cash for each 5s Apex stock unit—an offer valued at £11½ million. The Apex board, whose members hold about 10% of the stock, has agreed to these terms and recommends their acceptance strongly.

The reasons for so doing are stated to be that it is becoming increasingly difficult for the independent producer to operate as profitably as in the past and it is felt to be in the interests of stockholders and staff to become part of a large integrated oil group.

Profits for 1959/60 are said to have been adversely affected by the recent oilfield strike, the subsequent substantial wage increases, and the reduced oil selling price. Further, Texaco Trinidad Inc. has proposed a lower crude price to extend the purchasing agreement which terminates at the end of 1960. If accepted, this would result in a substantial fall in revenue. Meanwhile, Apex has several hundred barrels a day of crude lacking an outlet, as deliveries under the Texaco agreement are restricted to 8,250 b/d. In these circumstances, the 2s tax-free annual Apex dividend can only be achieved this year by calling on reserves, and in the next few years by drastic reorganization of operations.

New Tanker Drydock Facilities

Reconstruction of the Birkenhead yard of Grayson Roller and Clover Docks Ltd. has now been completed and facilities are in use for handling tankers up to 65,000 dw tons. Enlargement to this size from the original plan of 30,000 tons was due to the number of large tankers being built.

The recent launching at Joseph Thompson's shipyard at Sunderland of the 38,000-ton tanker "BUSIRIS" for the P & O group, by far the largest vessel so far put into the River Wear, is further witness to the determination of British firms to provide greater facilities for building the larger tankers now required. Major reconstruction of this yard has taken several years, and one of the new building berths can now handle tankers up to 65,000 tons. The "BUSIRIS," the eleventh of the P & O's new tanker fleet of 15, will be chartered to Shell on completion.

Work will start within the next few months on building a £4¼ million graving dock at Glasgow and it is expected that a fitting-out berth and a tanker cleaning installation will be available in two years' time. The government is lending £2,850,000 towards this project.

J. M. Storey, CBE, chairman of the Council of British Manufacturers of Petroleum Equipment, welcoming the guest of honor at the Council's annual dinner, Sir John Wrightson, Bt., chairman of Head Wrightson & Co. Ltd.

Equipment Men at Dinner

"Some years ago it was considered prudent to form the Dollar Export Council to attack the dollar markets. Undoubtedly that council has been successful. Why not investigate the possibility of forming other councils to concentrate on attacking other specialized markets?"

This question was asked by J. M. Storey, CBE, managing director of Dewrance & Co. and chairman of the Council of British Manufacturers of Petroleum Equipment, presiding over a record gathering of nearly 1,500 at the annual dinner in London in October. Membership had risen from 420 to 530 over the year, he said, and the council's articles of association had recently been liberally interpreted to permit the contracting engineers to become members, whether or not they were of British or foreign origin. He was happy to say that many of the American contracting engineers established in the UK had become members.

The guest of honor—Sir John Wrightson, Bt, chairman of Head Wrightson & Co.—commended the excellent work done in setting up the British Oil Equipment Credit Co. but urged members not to imagine that long-term credit terms with the indiscriminate granting of facilities to all and sundry could be their panacea.

Labor Seeks to Curb Fuel Oil

A new "immediate policy" for fuel and power, put forward jointly by the Labor Party and the Trades Union Congress, urges the government to resore the tax on fuel oil (a figure of 1½ d/gal, or 30s a ton, is mentioned) and to use the revenue therefrom to reduce the tax on diesel engine road fuel. Other proposals are that (a) the government should discuss with the oil companies the voluntary regulation of oil imports; (b) an independent investigation should be made into fuel oil production costs to determine how far the price of imported oil calls for action under anti-dumping legislation, and to review impartially the oil companies' price policies; and (c) dual-fired electricity generating stations which now burn oil should be converted to coal, and reasonable compensation (for broken contracts) should be paid to the oil companies by the government.

Calor Gas Expansion

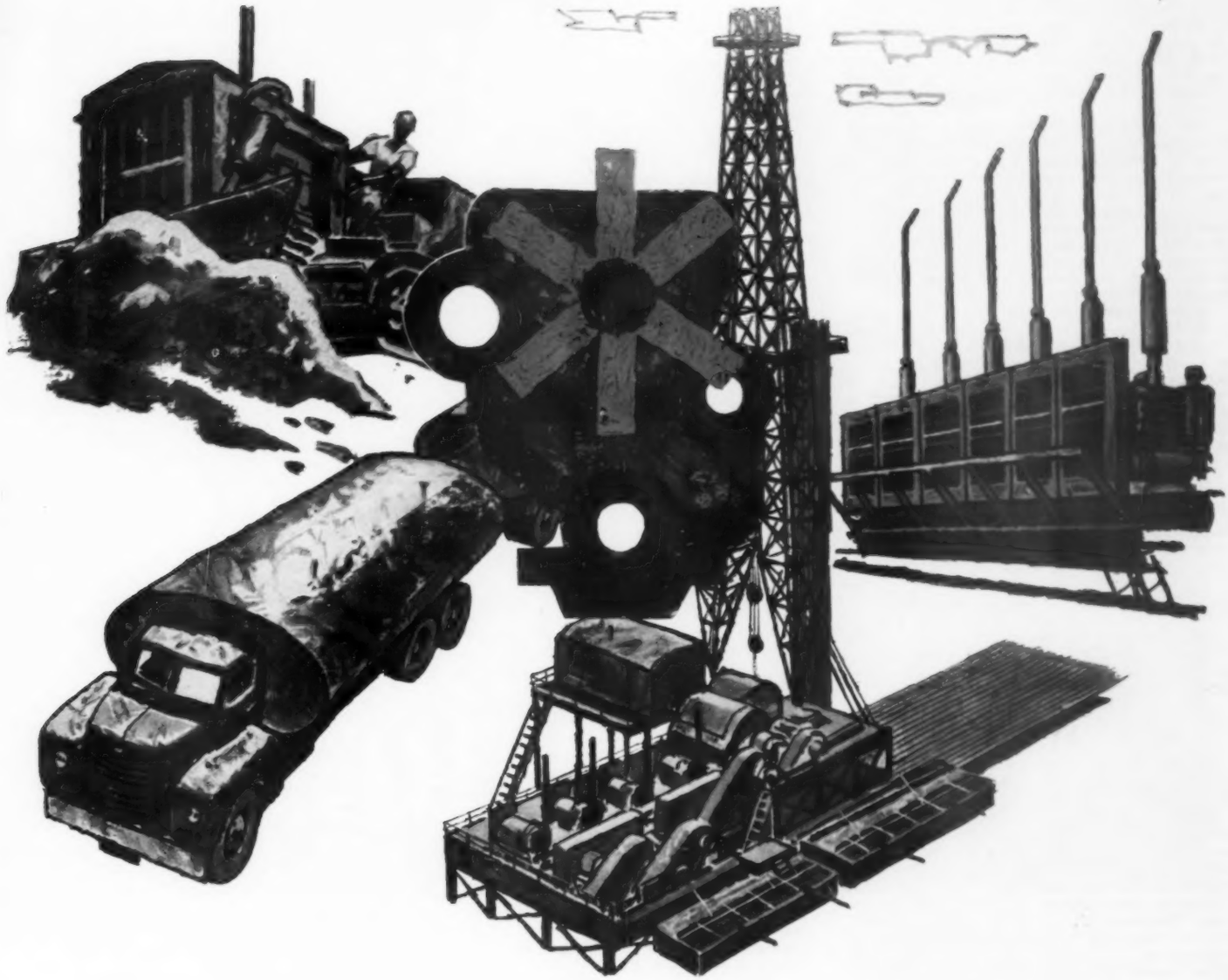
Calor Gas Holding Ltd. is raising about £1 million of further permanent capital to finance the building of three new liquefied gas filling stations, and for additional cylinders and equipment to meet expansion in the industrial field. These stations will be at Neath (South Wales), Ellsmere Port (Manchester Ship Canal) and Grangemouth (Scotland).

Biggest Tanker for Shell

The largest tanker so far built in the UK, the 65,000-dwt SS SERENIA, has been launched for Shell Tankers Ltd. at Vickers-Armstrongs' naval yard at Newcastle upon Tyne.

Principal dimensions are: length overall, 817 ft 9 in.; length BP, 775 ft 0 in.; breadth moulded, 112 ft 6 in.; depth moulded, 57 ft 9 in.: and load draft,

(*Continued on page* 10)



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42 ft 6 in. Cost is put at over £4 million and she is the first of three sister ships planned by Shell at the time of the Suez crisis. Because of its draft, the "SERENIA" will pass through the Suez Canal only partly loaded under present conditions and will top up in the eastern Mediterranean before proceeding to Europe.

Fully loaded she can carry a cargo of over 16 million gallons of oil from the Middle East and, also because of draft limitation, will be confined mainly to discharging at terminals with adequate facilities for a vessel of such size.

Vickers-Armstrongs (Engineers) Ltd. is supplying and fitting the machinery, which will consist mainly of double reduction geared turbines capable of developing 22,000 shp, sufficient to give a 16½-knot service speed. Two Babcock and Wilcox selectable superheat type boilers will be provided.

At the launching, the chairman of Shell Tankers —W. Wilkinson—announced that his company had decided to scrap 20 tankers amounting to 350,000 dwt as a contribution towards getting rid of the tanker surplus. Although they were good ships, none being over 16 years old, and would make an excellent fleet, he hoped other companies would emulate his company's action, instead of hanging on to obsolescent ships.

BP Kent Solvents Plant

British Petroleum Co.'s first UK plant for producing special solvents from petroleum spirits has been commissioned at the Kent refinery with an annual capacity of 30,000 tons.

"Solus" Petrol Station Inquiry

The question of the "solus" site system of retail petrol sale in the UK has now been formally referred by the government to the Monopolies Commission for investigation and report.

New Bulk Oil Terminals

The £2 million ocean terminal of Esso Petroleum on the River Tyne near Tynemouth was expected to receive its first oil cargo about mid-November.

John Laing & Son has started work on Mobil Oil's new 5,000-ton bulk terminal at Barry Docks (Glamorgan). This will be fed by sea from the Coryton (Essex) refinery and is expected to be in use by mid-1961.

Petrofina (Great Britain) Ltd. has recently opened a new Thame-side depot on a 3-acre site at Fulham. Built by Wm. Press & Sons Ltd. and with tanks by Whessoe Ltd., this has a total product capacity of 25,200 barrels, of which 12,400 barrels are in a 5-compartmented underground storage tank. The installation will be fed by barge from the company's ocean storage at the mouth of the Thames.

Hughes Tool Expansion

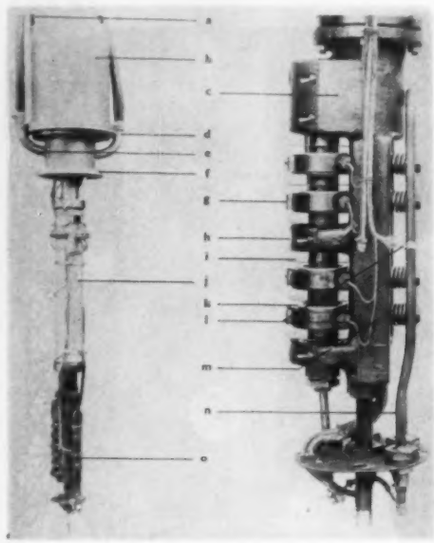
Hughes Tool Co. is planning a forging plant in a new building of 10,500 sq ft adjoining the drilling bit factory it established at Castlereagh in Northern Ireland about 5½ years ago. The equipment of the forging shop will include a 1,600-ton Ajax press. So far forgings have been imported from Scotland, but progress has been such that some 150 different rock bit sizes and types can now be made and it is felt the time has come to have the entire manufacturing production under the work's control.

Testing Nuclear Greases and Lubricants

In order to test its radiation-resistant lubricating oils and greases under actual operating conditions, Mobil Oil Co. Ltd. has developed the first dynamic rig running under simulated conditions of UK-type cooled reactors of high gamma flux. This has been operating since June in the spent fuel element gamma facility and products have been tested to radiation levels above 1,000 megarads.

By the use of this new test rig, termed SETRA (submerged elevated temperature, irradiation apparatus), it is said to be possible to determine within a few weeks the effects of radiation doses equivalent to the highest that can be expected in a year's use of the oil product in a nuclear reactor. Other advantages are that larger quantities can be irradiated and they can be handled immediately afterwards.

Referring to the photograph of the SETRA rig, it comprises an electric motor contained in the housing (b) driving the bearing and gearbox test assembly (o) by means of a drive shaft inside the extension tube (j). CO_2 passes down to the bottom of the test assembly by means of supply tube (a) and returns through the conduits (d) and (e) which also contain power and instrumentation cables. The extension tube and test assembly fit inside an irradiation sample can which is sealed by the adaptor (f).



The SETRA, Mobil Oil's new test device for nuclear lubricants. See accompanying text for explanation.

An enlarged view of the test assembly (o), at the right, reveals a test gearbox casing (c), these gears driving a shaft at 900 rpm, on which is mounted four test bearings contained in housings (g) which are loaded by means of "screw-down" springs (m) attached to the housings. The bearings are fitted with seals (k), but in the event of any slight leakage, seepage throwers (i) are fitted to the drive shaft to prevent contamination of bearings underneath. The temperature of the test assembly can be adjusted by means of heaters (n) up to 250 C, and the test bearing and ambient temperatures recorded by means of thermocouples (l). There are three sealed slave bearings, one inside the gearbox housing (c) and two in housings such as (h); the slave bearings can also be used to test greases if necessary.

Appointments

LAURENCE C. BERGQUIST has been appointed executive vice president and general manager in London of Iricon Agency Ltd., the body which acts on behalf of the eight independent US oil companies holding a joint interest in the Iranian oil consortium.

L. C. Bergquist

He succeeds Arthur H. Elliott, who has retired but will be a consultant to Iricon. Mr. Bergquist will also hold directorships in Iranian Oil Participants Ltd. and Iranian Oil Services Ltd.

T. F. McGUINNESS has been appointed technical manager of Regent Oil Co.'s technical services department.

L. C. EWIN has been appointed a director of London and Coastal Oil Wharves Ltd.

A. L. STOCK has been appointed a director of Wm. Cory and Son Ltd.

A. E. RICHARDS has been appointed managing director of Universal Matthey Products Ltd., the joint catalyst producing subsidiary of UOP and Johnson & Matthey, dealers in precious metals.

New Publication

"Basic Road Statistics 1960"—A literal vade-mecum compiled by the British Road Federation of the most reliable statistical information and notes on the various aspects of road transport in Great Britain and Northern Ireland. This is presented for a period of years up to 1959 under the following sections: I—Motor vehicles; II—Road traffic and accidents; III—Transport industry; IV—Roads; V—Motor taxation; and VI—Road transport legislation. Certain sections include some international comparisons. This 60-page reference work is available from the BRF, 26 Manchester Square, London, W 1, price 1s plus 5d postage.

Atlas Pipe Goes Overseas

Through a German corporation, Deutsche Atlas Bradford, GmbH, Universal Inspection & Service Co., a division of Atlas Pipe Inc., Houston, is expanding overseas. Its first operating division is Universal Engineering with headquarters in Dusseldorf, West Germany.

There it has installed equipment with personnel for the complete non-destructive inspection and testing of oil field tubular goods in the mills or in the field. In addition to West Germany this facility is to serve France, Belgium, Italy and Great Britain.

L. M. Johnson, who has had extensive experience in tubular goods testing with Universal in Houston, has been transferred to West Germany. Personnel there also includes Hellmut Reichenbacher. Their address in Dusseldorf is Frederich-Ebert Straus 11, telephone 1-8381.

Ethyl Introduces New Products

Ethyl Corp. has introduced two new compounds to its line of fuel and lubricant additives, bringing to five the number of new products announced since last Spring.

One is "Ethyl" Metal Deactivator, which is chemically N, N¹—disalicylidine propylenediamine, a chelating agent which is added to gasoline, jet fuels and distillates to counteract the harmful effects of copper on fuels. By combining chemically with the copper particles, it nullifies their tendency to promote fuel oxidation. It will be sold as a separate additive or in combination with "Ethyl" Antioxidant 733.

The other new product, "Ethyl" Antioxidant—ZDP, consists of zinc dithiophosphate and is an antioxidant and mild extreme pressure additive for lubricating oil.

HOMCO Names Vice President

Houston Oil Field Material Co., Inc. (HOMCO) has announced the appointment of B. R. Wakefield as vice president, special projects. Prior to joining HOMCO, Mr. Wakefield was associated with Arthur Young & Co. of Dallas. He is a graduate of Yale University.

Changeover Trailers

Two high flotation fully-tracked 28-ton trailers with removable bogies which can be converted on the spot to conventional road transport, the first to be made in the UK, were recently shipped to Port Harcourt for use by Shell-BP Development Co. of Nigeria for both swamp and road work.

Standard oilfield trailers were adapted to Shell ideas by Dyson Ltd., of Liverpool, using specially designed tracked bogies by J. A. Cuthbertson Ltd., of Biggar, Scotland.

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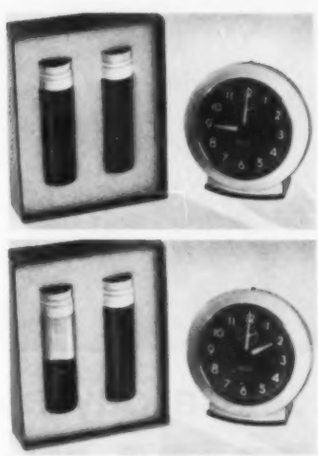
Less than one quart of Du Pont Marine Heavy Fuel Additive No. 1 will ordinarily keep 1,000 gallons of fuel free of sludge problems. Yet this amount assures ship operators of reduced operating and maintenance costs because Du Pont MHFA-1 will normally clean fuel systems of accumulated sludge while in use and keep them clean during operation. As an initial dosage, higher quantities of MHFA-1 are recommended to provide the dissolving and dispersing power you may need.

TYPICAL RESULTS. Du Pont MHFA-1 contains a powerful organic sludge dispersant. Operators find nozzle deposits and strainer deposits are reduced. Most find fuel filters stay cleaner . . . longer. These and many similar reports are common results with Du Pont MHFA-1.

For full details about Du Pont MHFA-1, and the name of your nearest distributor, write: E. I. du Pont de Nemours & Co. (Inc.), Petroleum Chemicals Division, Wilmington 98, Delaware, U. S. A.



In 5 hours, untreated fuel oil sample (at left in both pictures) shows significant sludge separation. But same fuel, with MHFA-1 added, remains evenly dispersed.

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MHFA-1 is available to you through a round-the-world distribution network, with service in:

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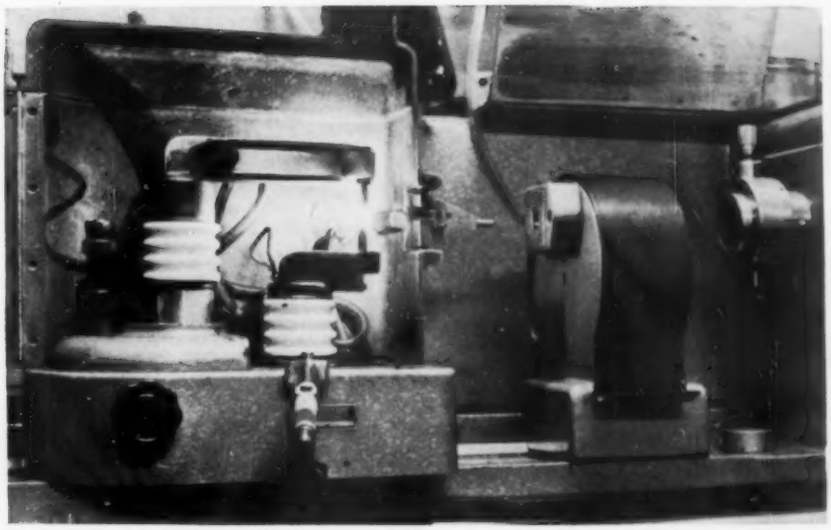
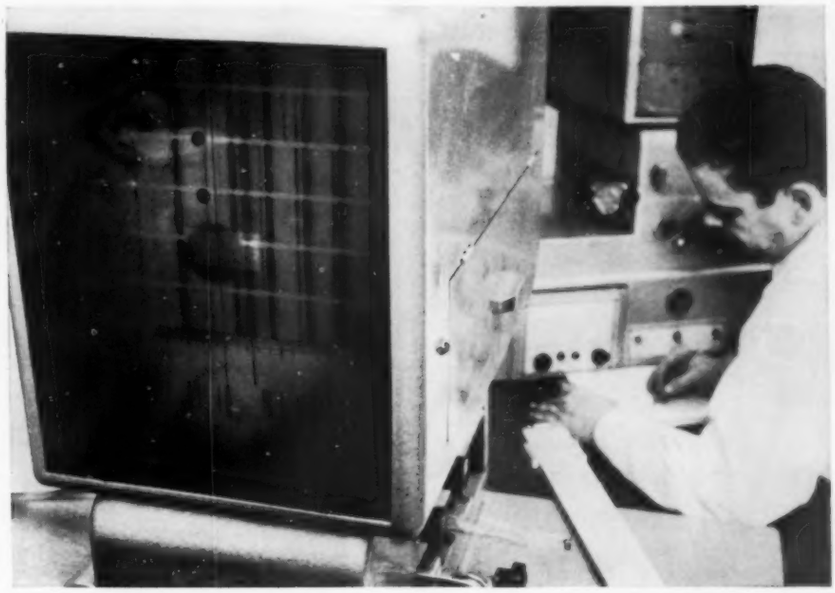


Emission Spectrograph (above) causes undesirable elements in a petroleum sample to emit their characteristic light spectrum which is photographed on a strip of film. In the Densitometer (below) the spectrum on the film is evaluated to identify the presence of metal contaminants down to less than one part per million.



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CANADIAN NOTES

Alberta Gas Line Contracts Awarded

Most of the contracts for construction of the Alberta Gas Trunk foothills division, and the Alberta Natural Gas 36-inch main transmission line across southeastern British Columbia, have been awarded to contractors. Work is starting at once and will be continued through winter, especially right-of-way clearing and grading, pipe stringing, and even 20 miles of pipe laying before big push starts in spring.

Alberta-Chicago Pipeline

Alberta officials are considering a multi-million pipe line project to carry natural gas liquids to the Chicago area of the U.S., amid signs that the Oil Import Administration does not want this much to come in.

The Oil and Gas Conservation Board has opened hearings at Calgary on a project in which Westalta Products Pipe Line Ltd. would build facilities from the southeast corner of Alberta to the Alberta-Saskatchewan-Montana border.

From there, Foothills Pipe Lines Ltd., and its subsidiary, Dakota-Eastern Pipe Line Co. would lay a line to carry the products to Chicago. Foothills seeks a 25-year permit to export up to 11,000 b/d of propane, 14,000 b/d of butanes and 43,000 b/d of pentanes plus. The permit would become effective Jan. 1, 1962.

Estimates are that Alberta production of the products by late 1962 will be 99,600 b/d and that needs of Alberta, Saskatchewan and British Columbia will be 31,800, leaving 67,800 b/d for export.

U.S. officials in Calgary say "assurances must be obtained from the U.S. government allowing entry of the products into the United States for the full term of the committed period. To obtain such assurances, discussion with the U.S. government must be entered into as soon as possible. These discussions cannot be seriously undertaken until the necessary permits have been obtained from the Province of Alberta.

"These negotiations and discussions, if finalized without delay, will allow the maximum advantage to be taken of presently existing markets and will provide for the greatest economic benefits to the province and the petroleum and related industries."

"If the Chicago market area is not obtained while it is available, the products from Alberta may never enter the area. This market is essential to the successful economic disposition of the products. However, in order to secure this presently existing market, it is necessary that the products move in sufficient volume in order to ensure a transportation tariff that will allow competitive pricing in the Chicago area."

Independents Organize In Canada

Formation by 30 minor oil producing companies of a new group called Independent Canadian Petroleum Producers is designed as first step in putting concerted pressure on federal government for action to help widen domestic oil markets in eastern provinces. Group emphasizes that it wants stated national oil policy, but not any specific project, and puts Montreal pipe line proposal far in background.

New LPG Line Planned

Surprise filing by Mid-American Pipe Line Co. indicated that it is prepared to build products pipe line from Superior to Chicago to provide market for Canadian LPG surplus. Condition is success of either of two applicants in current Alberta Conservation Board hearings: Provincial Products, or Hydrocarbons Pipeline. Mid-America is willing to take exports from either of them.

Kaybob Stepout

Strategic extension well 2¾ miles northeast of Kaybob oil field, brought in by California Standard, may have proven up all area between it and field in north central Alberta. Offset half mile south of discovery is new strategic test.

1960 Drilling Up

Drilling contractors expect to complete at least as many wells in 1960 as the 2,516 drilled in 1959.

Three giant mobile cranes hoist a ponderous 59-ton "stripper" tower, 150 ft in length, into position at B-A's Montreal East refinery. The tower is part of a $2,500,000 aromatics extraction plant currently under construction. Prime product of the plant will be benzene (B-A Photo)

September will be slack month, with rig count away down, but total completions are likely to exceed last September's 193 wells. Because of greater average depth, footage drilled is assured of two to three per cent increase over 1959, more if drilling steps up in final quarter.

Canadian Gas Starts Flow to USA

Natural gas from Canada began flowing across the border to the USA Midwest for the first time recently, weeks ahead of schedule, when Midwestern Gas Transmission Co. (Tennessee Gas subsidiary) started operation of its $52 million, 559-mile, 204 mmcf-per-day pipeline system. Deliveries of the line, whose construction began last July 15, originally were scheduled to begin November 1.

Canadian Demand To Rise

Neil Lilley, president of Texaco Canada Ltd., predicts demand for oil in Canada should increase 75% by 1970, while crude exports to the USA should reach a level equal to about three times the present rate. Present oil consumption is about 860,000 b/d; and crude exports to the USA run about 120,000 b/d.

Canadian Water Flood

Contract has been let for construction of a water-injection pipeline system for major project, in Steelman oil field, southeastern Saskatchewan. Producers estimate this secondary-recovery program will add 10,000 b/d producibility per year for next two or three years. Successful pilot program led to full-scale project.

No Surplus Condensate

There will be no material surplus of condensate for possible export from wet-gas field production, according to a Stanford Research Inst. appraisal. Forecast range of surplus over domestic demand is only 32,000 b/d maximum in 1965, and 6,000 b/d minimum in 1970.

Husky Reorganizes

Canadian Husky Oil Ltd. has realigned the responsibilities of its senior management personnel and created an executive committee of officers as part of its plan to integrate the company's Canadian and United States operations. The management changes follow a reorganization of the Husky board of directors.

Husky's president, Glenn E. Nielson, said the new executive committee functions as an internal board to coordinate operations and implement objectives and policies set by the board of directors. Each of its members holds the same office in the Canadian and U.S. companies. Lawrence W. Lee, M. R. McArthur and Geo. S. Buchanan were named senior vice presidents. Mr. Lee coordinates manufacturing and marketing activities of the company, including oil, steel and briquetting operations. Mr. McArthur directs oil and gas production and drilling and is president of Husky's partially-owned subsidiary, Rimrock Tidelands, Inc. Mr. Buchanan is in charge of foreign operations and special projects.

Mission Reorganizes

An extensive program of reorganization and realignment of sales facilities and personnel is currently underway at Mission Manufacturing Co. according to T. R. Fullinwider, vice president, domestic sales. Included in plans to better coordinate sales and service operations in the Western portion of the U. S. is a shift of the firm's Northern and Southern Rocky Mountain territories to its Western District, headquartered at Los Angeles and managed by C. E. Van Loozen.

A field office for the Northern Rocky Mountain area will be maintained at Casper, Wyoming. Harvey E. Durham has joined Mission to head this office. The Southern Rocky Mountain region office will remain in Denver and will be managed by Henry Lee, who has been transferred to that area from the West Texas-New Mexico District office in Odessa. The panhandle area has been incorporated in the firm's Mid-Continent district in a move to better coordinate sales and service activities in Northwest Texas.

C. R. Boll

R. Hatchitt

Hatchitt and Boll Appointed

The appointment of C. R. Boll to the newly created position of executive vice president—marketing and Reece Hatchitt to the newly created position of vice president—International Operations has been announced by Cummins Engine Co., Inc.

Mr. Boll joined the company in 1941 immediately after graduation from Purdue University. Having recently served as vice president—sales, he also held positions as manager—engine sales and general sales manager.

Mr. Hatchitt will direct foreign operations and the activities of Cummins Diesel International Ltd., Nassau, Bahamas, and Motores Cummins Diesel do Brasil at Sao Paulo, Brazil. Cummins has a third subsidiary, Cummins Engine Co. Ltd., with manufacturing facilities at Shotts, Lanarkshire, Scotland.

CB&I Opens in Netherlands

Chicago Bridge & Iron Co. has announced the establishment of an engineering office in The Hague, Netherlands to assist the company's European subsidiaries and licensees. Heading the new branch of the world wide steel plate fabricating firm is Taavi Kaups, a former member of CB&I's general engineering department in Chicago.

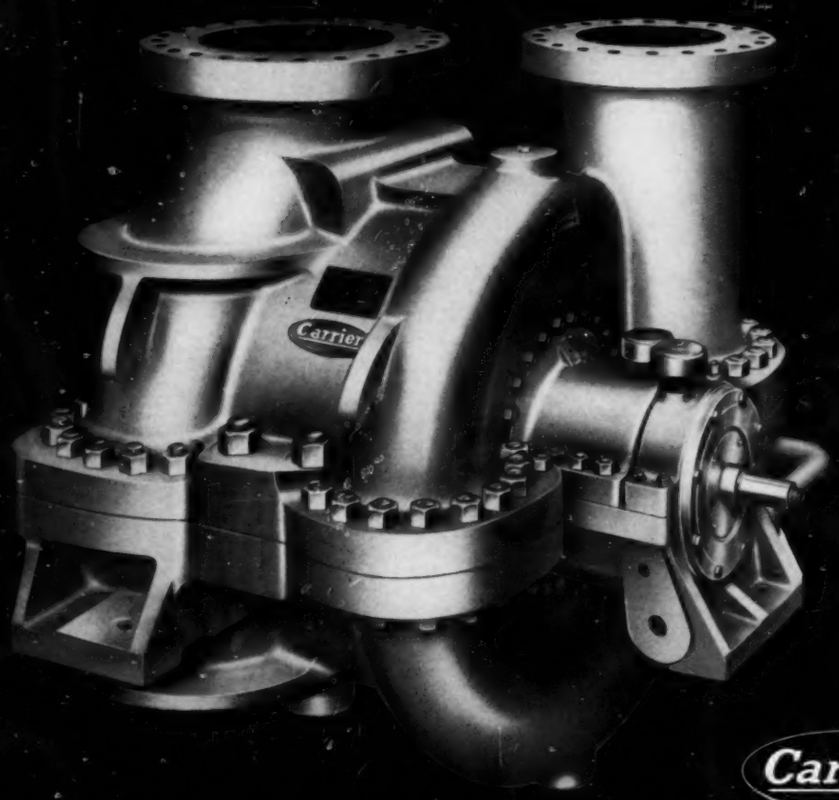
Halliburton Electronics Expansion

Initial moves for a major expansion of activities in the electronic field by Halliburton Company, Duncan, Okla. were announced following a recent meeting of the Halliburton Company Directors in Denver. Welex Electronics Corp. is being transferred to parent company control by Halliburton and thus will attain full status as a direct Halliburton subsidiary.

W. J. Greer of Houston, former Welex vice president and director of research and engineering, has been named chairman and chief executive officer of Welex Electronics, and has also been elected vice president of Halliburton. Welex Electronics now has executive offices and manufacturing facilities located in Washington, D. C. and an eletronic research laboratory in Houston.

IN CANADA: G. DIKKERS OF CANADA LIMITED, SCARBOROUGH, ONTARIO

Centrifugal gas compressors from the company that has built more multi-stage centrifugals, handled more kinds of gasses, and has the most modern facilities for production. For use with any type drive, they range in capacity from 1000 to 150,000 cfm. For full information write Centrifugal Department, Carrier International Ltd., 385 Madison Avenue, New York 17, N. Y., U.S.A.



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'THERMEX' heat transfer medium is the first eutectic mixture of diphenyl oxide/diphenyl to be manufactured in Great Britain entirely from U.K.-produced materials.
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If you want further information, please write; if you'd like a technical visit, please get in touch with the nearest I.C.I. Sales Office.

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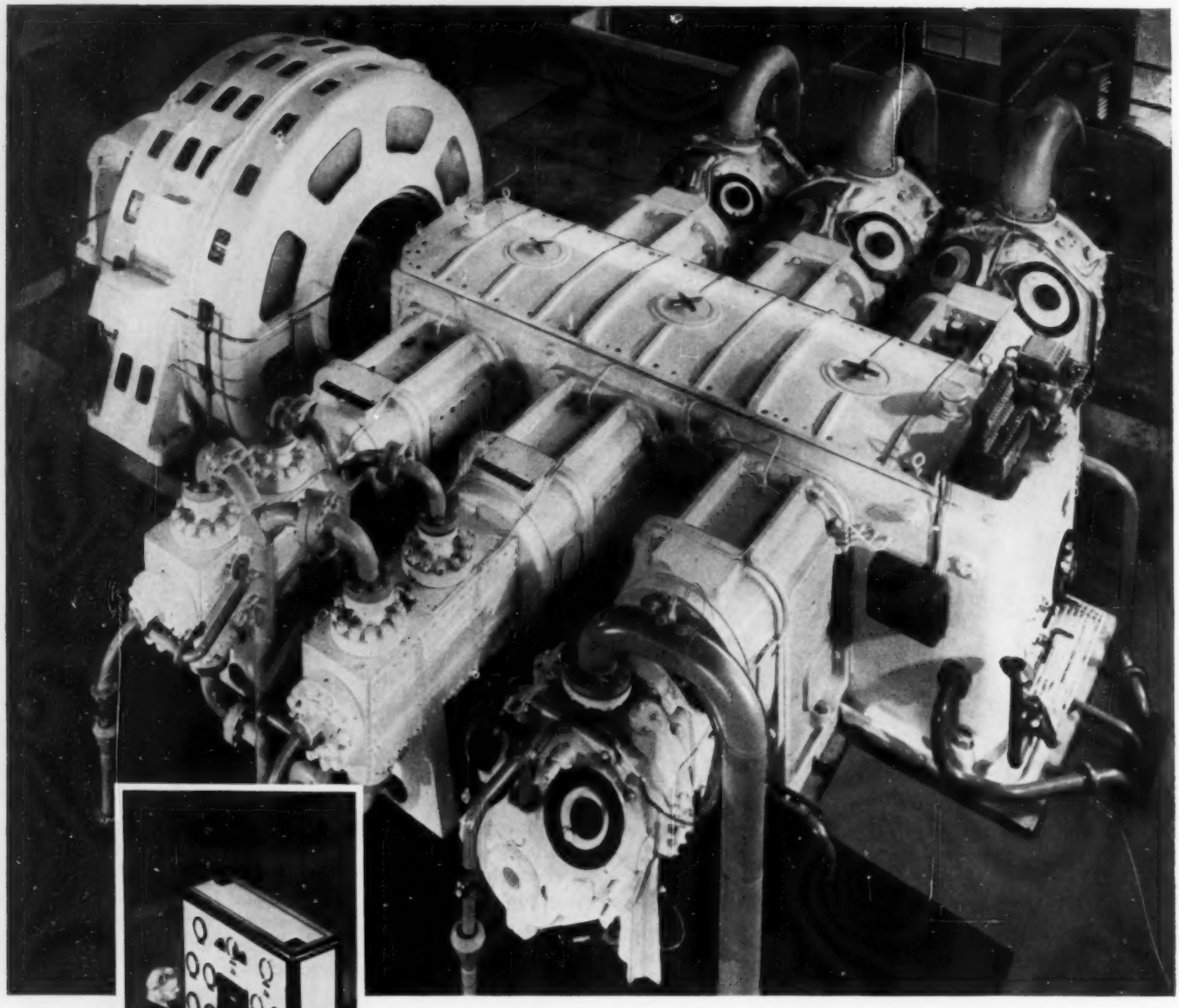

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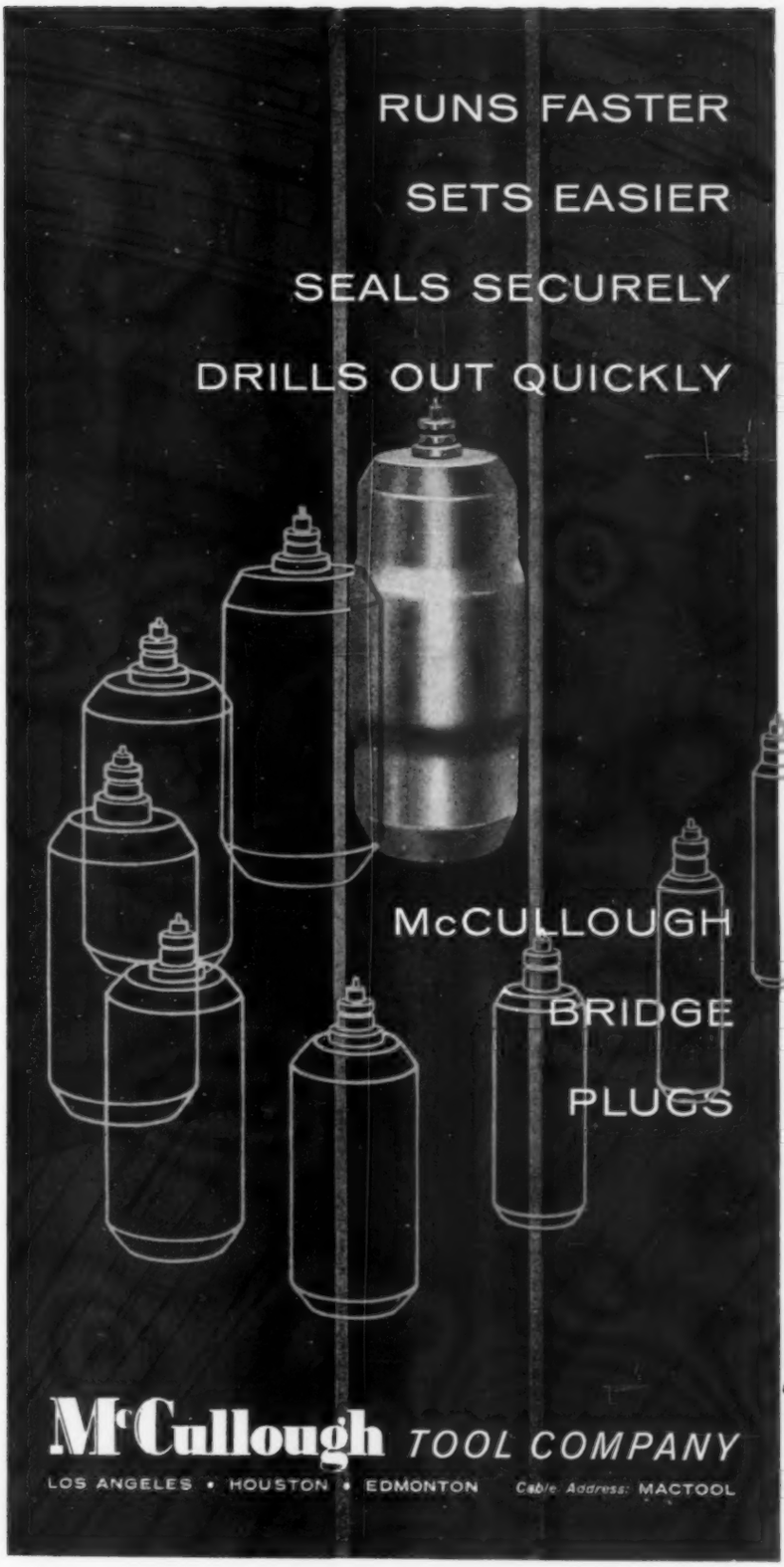

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A LOOK AT
THESE
FEATURES

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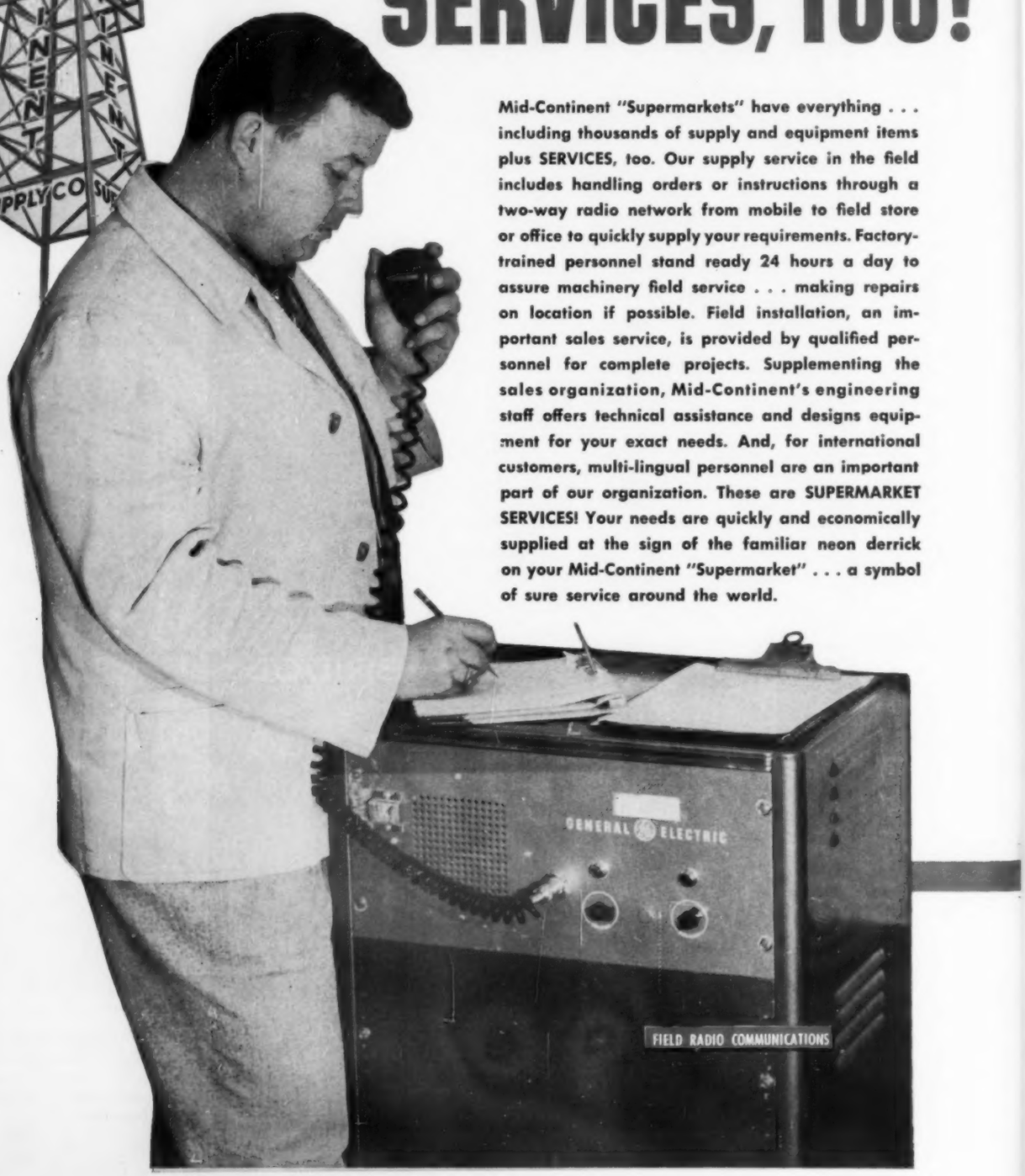

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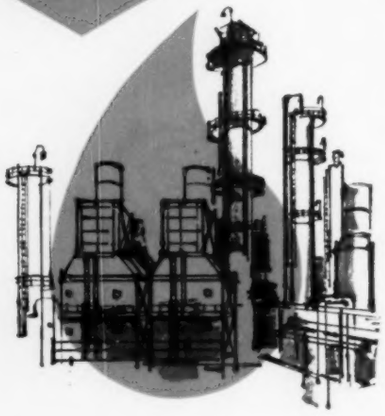

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LATIN AMERICAN OIL NEWS

ARGENTINA—Officials place Argentina's total crude production, January through 1960, at 5,136,044 cubic meters, a 28.6% increase over the 3,994,976 in the corresponding 1959 period. These figures include YPF's own production, that of foreign firms under contract to YPF, and private concessionary companies. In July, YPF produced 828,373 cubic meters, and contracting firms 783,605. Combined August estimate for YPF and contracting firms (excluding private concessionaires) is 878,753 cubic meters, 12% over July. Present production of Tierra del Fuego, at the southern tip of Argentina, is reported around 2,500 cubic meters per day, and YPF's president predicts it will reach a million metric tons within 12 months. Tennessee Argentina SA delivers the crude to YPF at US $11.15 per cubic meter (in pesos at the international market). For natural-gas deliveries, the price is US 20¢ per 100 cubic meters.

ARGENTINA—Esso Standard is studying oil and gas prospects of the south flank of the Comodoro Rivadavia among areas released by YPF for private tender for oil exploitation. Believing that within 18 months Argentina will be not only self-sufficient in oil, but an exporter of crude and products, Esso's investments in Argentina could climb to $70 million. This would include $9 million already spent on exploration in Esso's Neuquen zone; the 23 million Challaco-Rosales pipeline Esso is constructing for YPF; an $8 million expansion of Esso's Campana refinery; and $30 million for a proposed lubricants refinery if Esso is awarded the contract.

BRAZIL—Brazil's crude output in September totaled 2.7 million barrels (90,000 b/d); 62 rigs were operating (96 in September 1959); 69 teams were working—nine surface-geological, 36 exploratory, 10 gravimetric, and 14 seismograph. Wildcat No. 3 on the Sao Francisco River produced 130 bbl of crude on a 24-hour test. A fourth wildcat is now being drilled nearby. Oil shows have been encountered in exploratory wells around Cacador in Santa Catarina state, and in the Dourados municipality of Mato Grosso Drilling in the Campos area of Rio de Janeiro (state of Espirito Santo) has been suspended, with no oil shows. At Jacaranda (in Bahia state) ¼ mile south of Sao Sebastiao, oil and gas shows appeared at 3,659 ft. Exploration has started in the Tucano valley (Bahia), and three miles from Aracatuba, in Sao Paulo.

During the first four months of 1960 (latest available data), Petrobras completed 75 wells, of which 48 are oil producers, 26 dry, and one for injection. Of the total, five were drilled in Amazonas, one in Maranham, four in Alagoas, two in Sergipe, 59 in Bahia, one in Espirito Santo, one in Sao Paulo, and two in Rio Grande do Sol. The 48 oil producers and 10 of the dry holes are located in Bahia.

Presidente Bernardes refinery, at Cubatao, began processing 120,000 b/d on September 12.

Petrobras has obtained credits amounting to US $16,300,000—to be amortized in five years—from European manufacturers of petroleum equipment.

S. S. "Candeias," first of a series of six 10,000-ton tankers ordered in Denmark, arrived in Brazil from Philadelphia with a cargo of lubricants. The keel of N. T. "Agua Grande," last of the series, has been laid in the Burmeister Weis yards.

Net expenditure on imports of crude and products declined to 221 million dollars in 1959 from 252 million in 1958.

Brazil's president has submitted a bill to the congress, accompanied by a draft law granting exemption of duties on materials to be imported by Industrias Quimicas SA to install a polyethylene plant at Santo Andre, in Sao Paulo.

Petrobras is building an ocean terminal on Ilha d'Agua, in Guanabara Bay, Rio de Janeior, to supply crude to the Duque de Caxias refinery now under construction at Kilometre 11 of the Rio-Petropolis Road, and to transport the latter's products to the pier at which the tankers will moor. A small pier on the island will moor the lighters for transport of products within the bay. Principal pier, 138 ft long, will be in the ocean—with accommodations for two supertankers loading and discharging simultaneously. The 10.8-mile (8.4 miles underwater) pipeline starts at Agua Island, crosses Governador Island, and ends at the refinery. Consisting of two 26-in. crude lines and two 14-in. product lines, capacity is 20,000 bbls per hour.

CUBA—The Esso Belot refinery at Regla has been renamed the "Nic Lopez" plant, and the Texaco plant at Santiago the "Hermanos Diaz" refinery—the new names coming from dead members of the revolution. Cuba reports plans to step up exploration and exploitation of crude oil, enlarging refineries, setting up a petrochemical plant, purchase of tankers to go "into the export market" with Cuban products. The Ministry of Commerce and the Cuban Petroleum Inst. are drawing up plans for a single price for gasoline throughout the island; and Soviet geologists report oil can be found in coastal parts of Cuba, and that the water is shallow enough to permit exploration and exploitation.

MEXICO—A Mexico City dispatch says Pemex, the government's oil agency, is attempting to convert some 900 million pesos ($72 million) in short-term loans from USA banks into 12-year financing. The agency is relying on improved international credit ratings to ask USA banks for the extension at 5% or 6% annual interest. The loans were made primarily to purchase equipment in the USA.

NICARAGUA—International Oil Participants Corp. is reported sending a team to start exploration near Lake Nicaragua. With IPOC also interested in setting up a refinery, the group consists of Joseph W. Frazer, former president of Kaiser-Frazer; George C. Sheahan, a Sunset Petroleum International vice president; Hernando Ramirez, executive director of Latin American Chamber of Commerce; Clive F. Webster, IOPC vice president; and Joseph A. Jones, an American News service ex-president.

Oil-company officials feel sure exploration is intended, but they see no need for a refinery in addition to the one Esso is about to start and the one Royal Dutch-Shell is planning. If it goes ahead, IOPC would be the only firm engaged in exploration. No work has been done since May 1960, when Henry Raasveldt of Empire Resources Co., New York, left.

PERU—The National Mining & Petroleum Socy. has written the president of the Peruvian senate of its "deep and justified concern" over a bill to "expropriate the petroleum industry operating on the coast." If Art. 36 of the constitution were written into the bill and interpreted as General Alejandro Barco wishes, "companies having foreign stockholders would lose to the State not only the petroleum concessions located within 50 kilometers of the sea, but also all the mines, farms, lands, houses, and other property they might hold," said the society's letter—"adding that Peru requires for its progress large national or foreign capital investments that are only attracted by a climate of confidence, which really vanishes under the concern resulting from the threat of expropriation."

VENEZUELA—Venezuelan Oil Minister Juan Perez Alfonzo has flatly denied that Venezuelan oil companies have been selling oil to the Dominican Republic in violation of the spirit of the Declaration of San Jose, in which members of the Organization of American States agreed to economic sanctions against the Dominicans.

VENEZUELA—London sources report Juan Perez Alfonzo, Venezuela's minister of mines and hydrocarbons, to the effect that the five oil-producing countries (including his own) which recently set up in Baghdad the Organization of Exporting Countries have agreed to hold down production and push up prices. The Perez Alfonzo statement came hard on the heels of the Baghdad meeting. He said Venezuela had advised oil companies to hold to no more than 5% their discounts off the posted prices—and this 5% to long-term customers only. If they do not hold their discounts down, he said Venezuela will have to "stop their production." He said that now 80% of Venezuelan crude moves at discounts up to 8% to 10%; the rest at posted prices. By 1970, said the Venezuelan official, the North American continent may need Middle East oil to supplement its production to keep pace with demand.

The other nations which have ratified the arrangement are all Middle Eastern: Iran, Iraq, Kuwait, and Saudi Arabia. Actually, the latter (the original proponent of the idea) has not yet ratified, but is expected to do so soon. What links all five is that they have large oil surpluses to export. International oil men previously had pointed to the unworkability of schemes for holding up prices by withholding supplies. In effect, industry sentiment is that there are other oil-producing countries, outside the five, ready and willing to bring their plentiful oil supplies to world markets.

Generator Shipped by Clipper

The electrical field section of a gas turbine generator used in the Venezuela operations of Creole Petroleum Corp. is shown arriving in Miami for an overhaul. Almost the entire load of a Pan American Cargo Clipper, the unit weighed 14,510 lbs. It was consigned to the manufacturer, General Electric Co., at its Hialeah, Fla., plant, where the overhaul work was to be done.

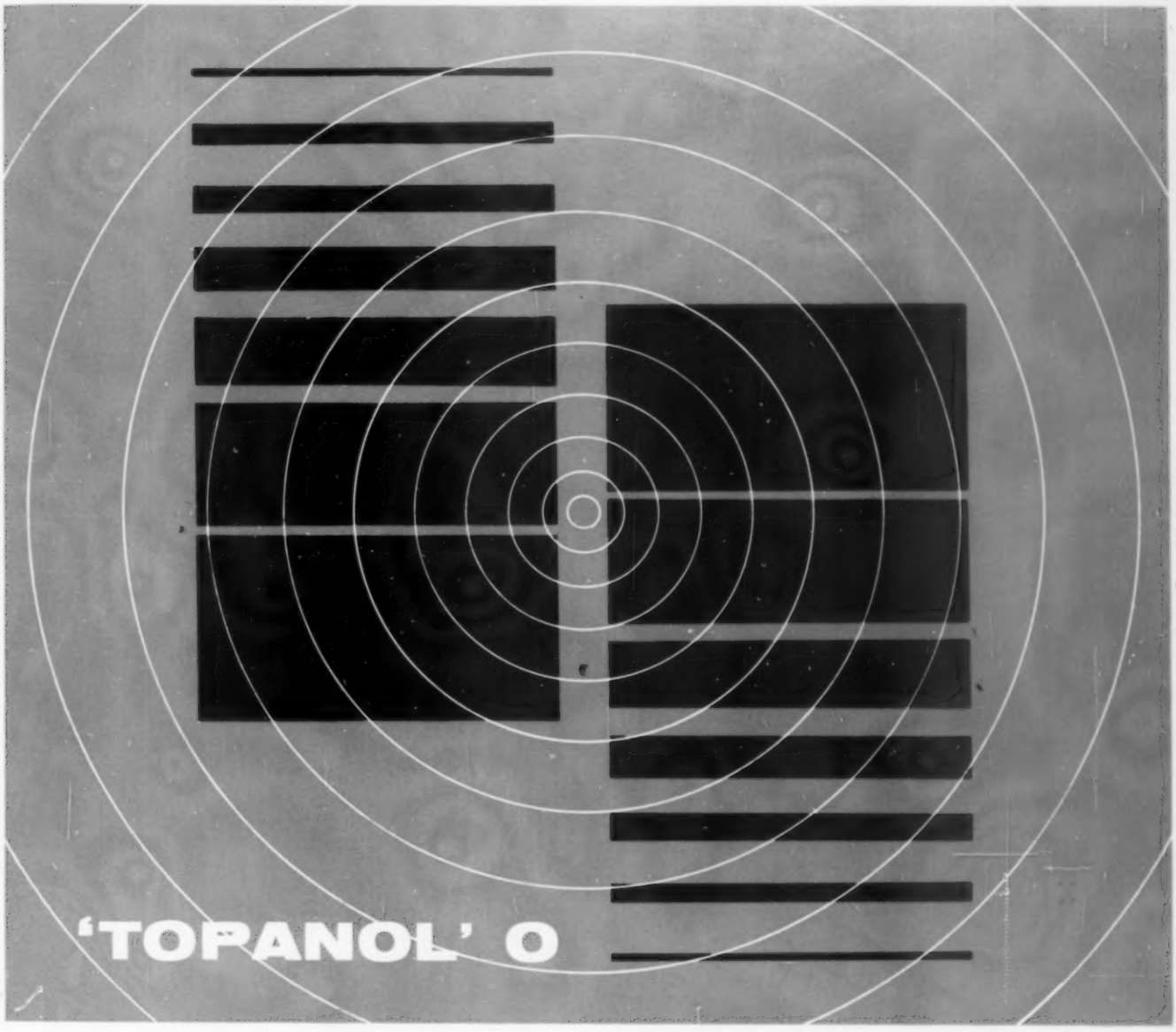
Lunar Drilling System

Drilling on the moon is nearing reality. Hughes Tool Co. has announced the completion of a first phase contract for a lunar drilling system to be rocketed into space by an unmanned space ship sometime in 1963.

The Hughes lunar drilling system is under consideration by Jet Propulsion Laboratory of California Institute of Technology, administrator of a multimillion dollar project sponsored by National Aeronautics and Space Administration. Its purpose is to learn more about the composition of the moon, its atmosphere and conditions that would effect future manned explorations. Several companies are working on the unmanned space craft that will carry the drilling system to the moon, including Hughes Aircraft, McDonnell Aircraft, North American Aviation and Space Technology Laboratories. The Hughes lunar drilling system is designed to collect samples of the moon's surface for analysis by some means, such as X-ray diffraction. Results of the analysis will then be radioed back to National Aeronautics and Space Administration scientists controlling the experiments on earth.

The Hughes engineering team that developed the lunar drilling system was confronted with a number of unusual environmental problems: vacuum, extreme temperature changes and low gravity, and the fact that the materials on the moon's surface are unknown. Others feel that the surface may be like a hard granite. The drill must therefore be able to drill either hard or soft material. M. E. Montrose, senior vice president and general manager said that if the Hughes lunar drill is accepted by JPL, it is expected that it will be extensively tested in Hughes' drilling research laboratory in Houston, largest in the world devoted exclusively to the study of various drilling methods and the testing of new rock bit and tool joint designs and materials.

The lunar drill is miniature by oilwell drilling standards. It stands five feet high. Made of exotic metals, it will weigh 60 pounds on earth and 10 pounds on the moon. It will drill a small diameter hole to a depth of several feet and will be capable of penetrating dust or granite-like rock.



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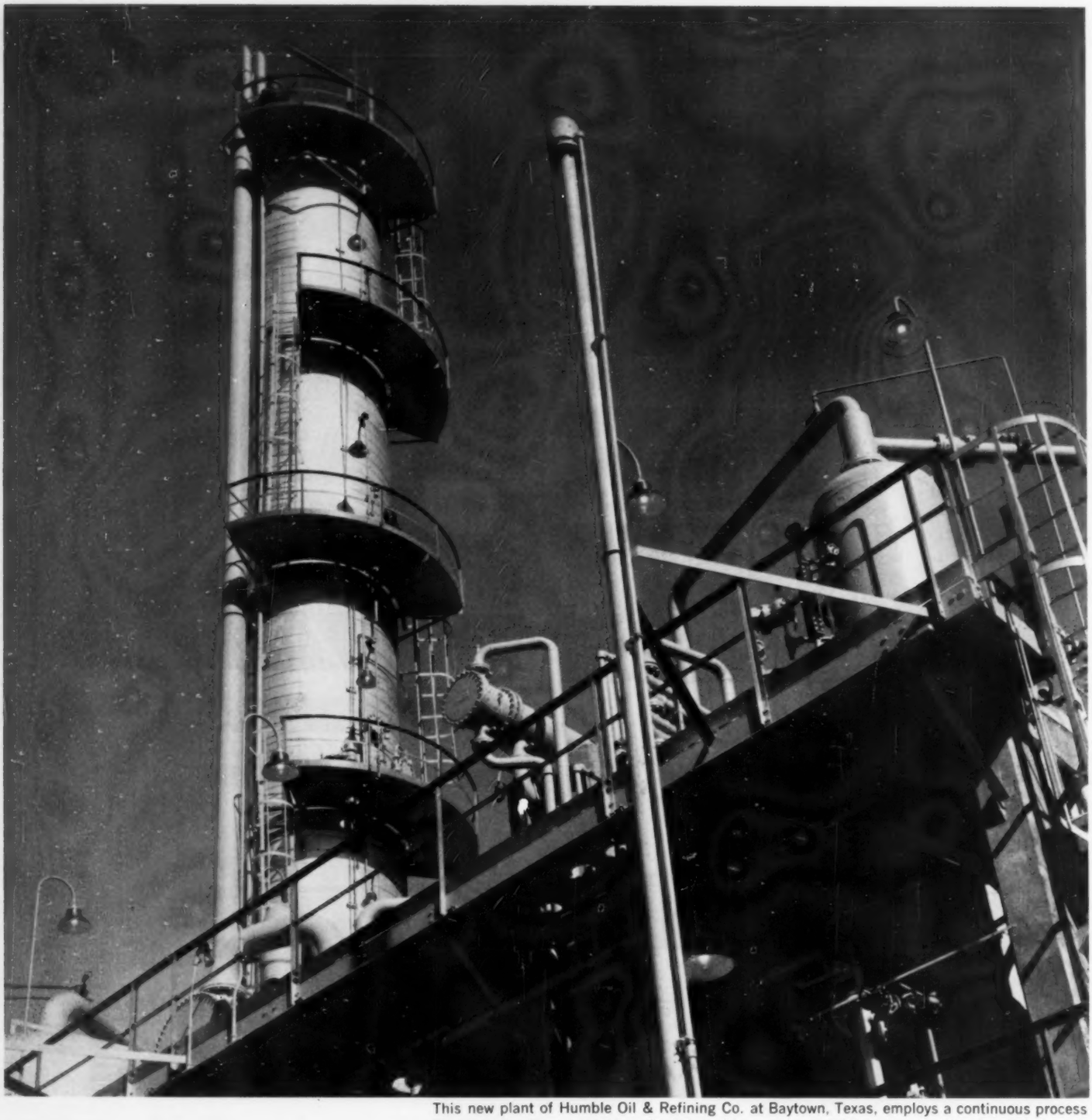

This new plant of Humble Oil & Refining Co. at Baytown, Texas, employs a continuous process for producing large quantities of polypropylene - raw material for a wide variety of useful plastics.

"We cannot afford to be inefficient in the use of capital or labor. We must aim at increased national productivity; we must stimulate research and invention; we must reward ability and initiative; we must encourage capital generation and productive investment. If we fail to do these things we will move backward in the world picture instead of forward."

—Leo D. Welch, Chairman of the Board

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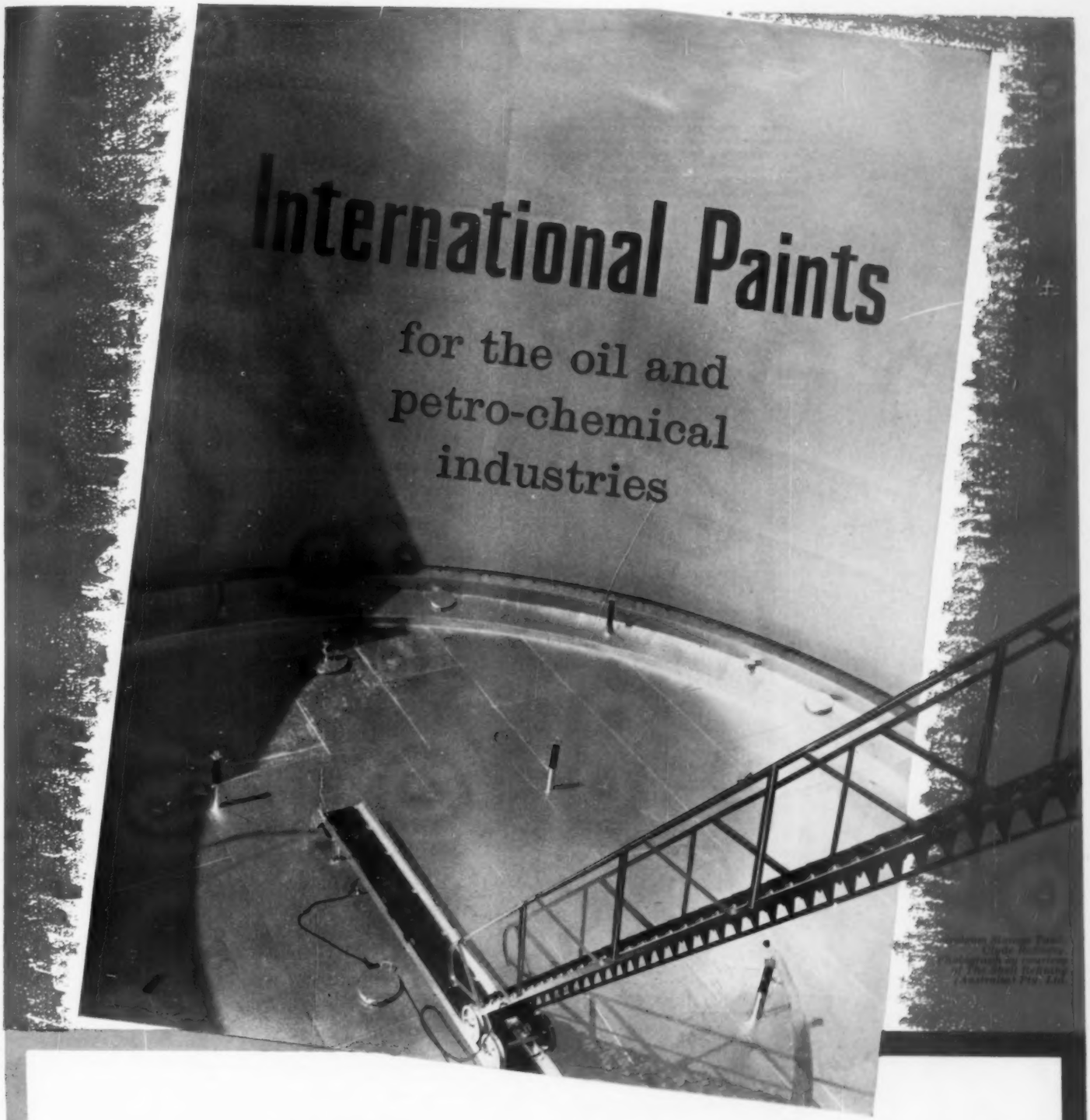
Standard Oil Company (New Jersey)



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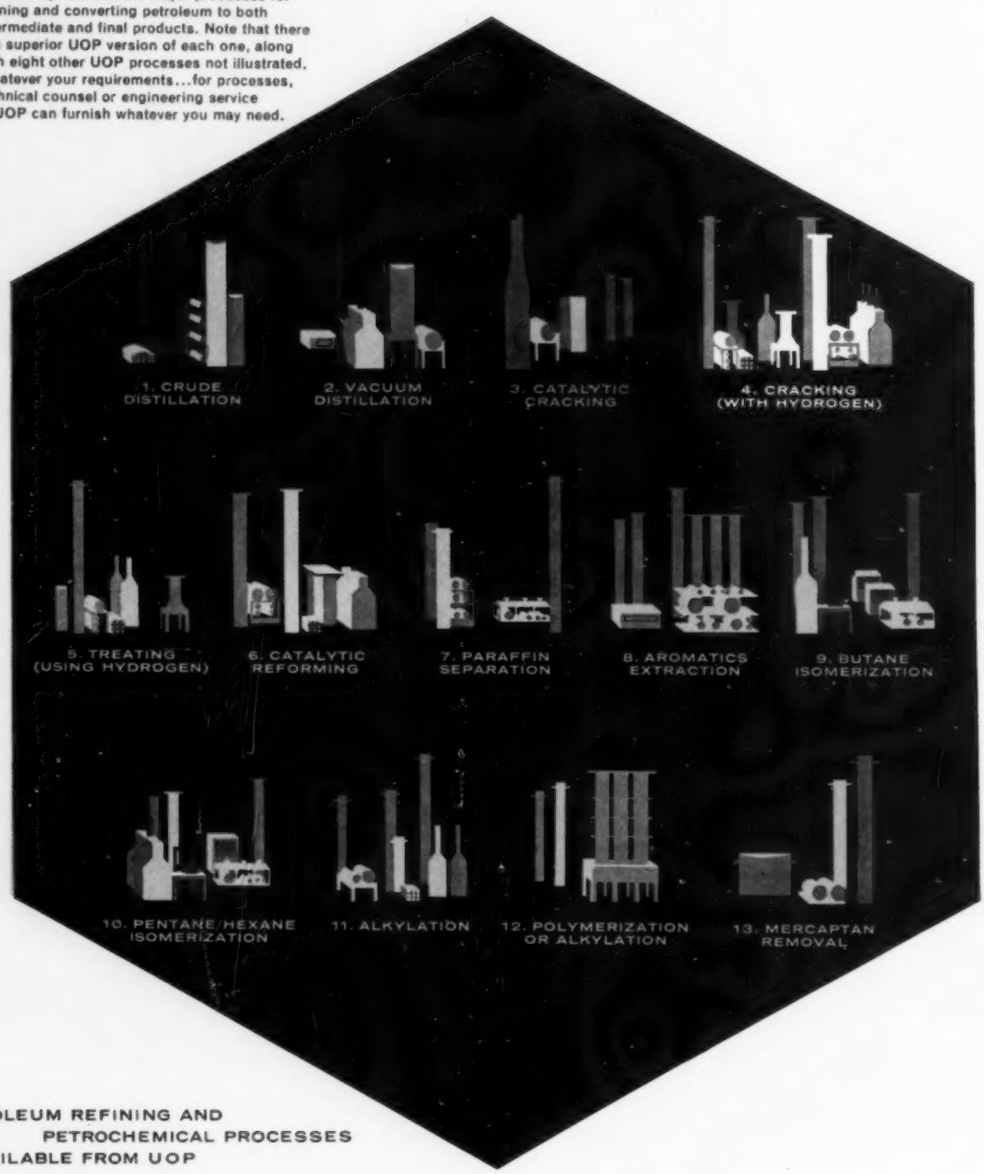
A WORLD-WIDE PAINT ORGANISATION

Here are symbolized the major processes for refining and converting petroleum to both intermediate and final products. Note that there is a superior UOP version of each one, along with eight other UOP processes not illustrated. Whatever your requirements...for processes, technical counsel or engineering service ...UOP can furnish whatever you may need.



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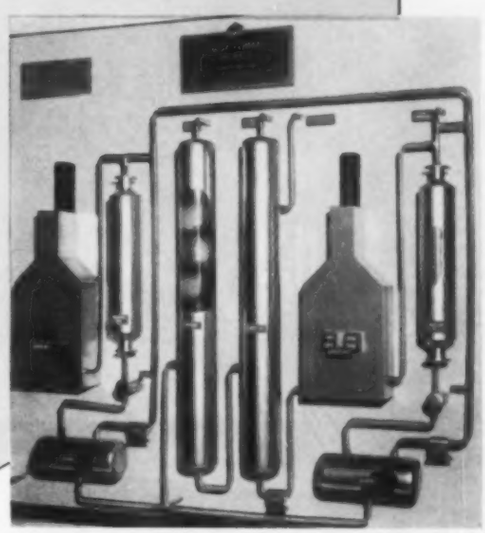

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WHERE IN THE WORLD

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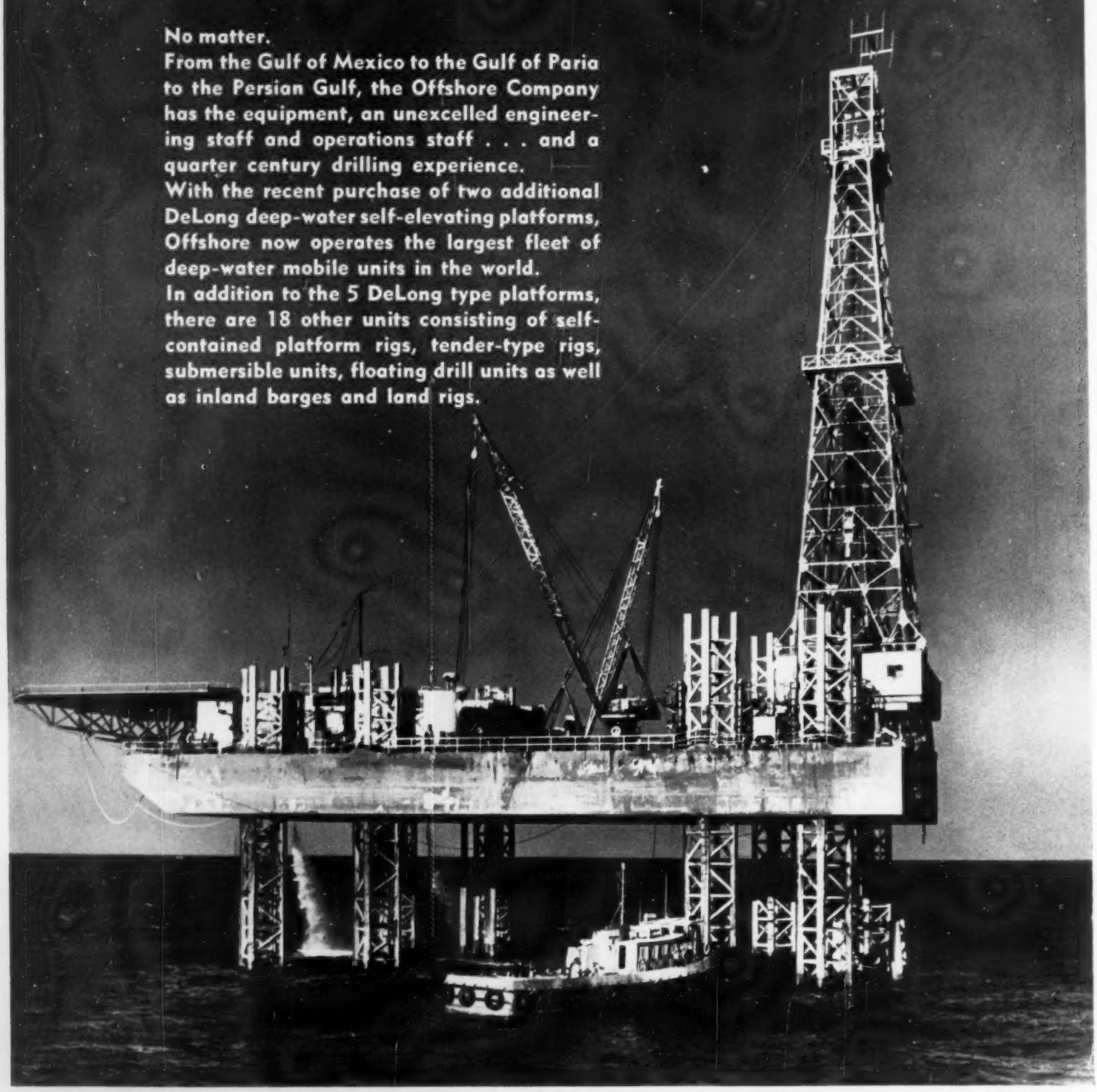

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COMPETITION AND COMMUNICATION

It is no exaggeration to say that in the 100 years of its existence the international oil industry has never faced a greater challenge from without and fiercer competition from within than it does right now. One has only to contemplate the two principal problems facing oil today to understand their complexity.

On the one hand, a long-term look into the future give a glimpse of an enormous energy void that will call for the ultimate in investment and work by the international oil industry. A recent estimate shows that by 1985 the world's proved reserves of recoverable oil, about 290 billion barrels, will be entirely consumed. To replenish the supply an equal amount must be found. That means that in the short space of 25 years some 300 billion barrels of crude reserves must be found, truly a stupendous task.

Looking at the other hand, the short-term view is the exact opposite. The world is swimming in a sea of oil plenty, with all the problems that entails. World prorationing plans are being set up by producing governments, to handle the surplus, a commendable idea in itself but one that may take so long to complete that the period of shortage may be upon us before any action can be taken. If this were not enough, Russia is now emerging as a large petroleum exporting nation and a major threat to world crude price stability. The recent statements by Russian delegates to the Second Arab Petroleum Congress showed the Russian determination to "regain their pre-war share of international oil markets," which would be about 14% of world oil exports—but rising in some years to over 30%.

Under these pressures, the oil industry has become fierce'y competitive. The recent announcement that Standard Vacuum Oil Co. will be dissolved within a short time underlines the fight raging on the international scene. To its parents, Standard Oil Co. (New Jersey) and Socony Mobil Oil Co., who each own 50% of Stanvac's assets, the split is necessary to enable the companies to carry out their oil operations efficiently. To the Justice Department, however, which instigated the dissolution and sanctioned it in a recent decree, the Russians are at the bottom of it all. The primary reason for the Department's insistence on Stanvac's lapsing back into direct control by its parents was Russian competition. So serious does the Department consider the Russian threat that it believes Jersey Standard and Socony must have the necessary flexibility the split-up will give them to continue to meet competition effectively in the Far East.

The situation is one which calls for the very best qualities of self control and understanding on the part of oil industry leaders. The oil industry has failed in communications, not only in with the general public but in communicating with government leaders responsible for oil's regulation as well. This was clearly brought out in the Arab Petroleum Congress during October, when Sheikh Abdullah Tariki, Saudi Arabia's oil chief, charged at one point that the oil companies were "treating us like children!" and won applause. He charged that oil negotiators had bound "ignorant government" to iron-clad contracts that were excessively profitable to the companies. Pointing out that without Aramco, Sheikh Abdullah and his country would not be where they are today does nothing to remedy the situation.

The oil companies do not understand the Arab viewpoint either. The intensity of Arab desire for more participation in company operation is not completely appreciated and the lack of communications and understanding is threatening to permanently disrupt the faith oil governments have in the companies.

There is, however, a real common basis of interest between producing countries and their oil companies. That basis is the further development in an orderly way of their oil resources. It is toward that end that oil companies and governments alike must strive, via increased understanding of each other and the willingness not to ask for that little bit extra that the other cannot give.

Venezuela's changing oil policy

by Francisco R. Parra

Drastic changes in the last three years include higher taxes, government control of export prices, direct government participation in the oil industry, and a more control-bent attitude. Success or failure of these policies will greatly influence policies of other oil producing countries which follow Venezuelan developments with a watchful eye

It is three years since the regime of General Pérez Jiménez was toppled in a January 1958 revolution, and almost two years since the present coalition Government of President Romulo Betancourt took over from the provisional administrations of Presidents Larrazabal and Sanabria. There have been several marked changes in official Venezuelan policy toward its oil industry during this period.

Petroleum policy during the previous ten years had been quite consistent. The Government appeared to be content with the 50/50 formula of profit-splitting, and there was little talk of changing it. It had, depsite the companies' original opposition to the measure, come to be considered as a generally fair basis. The industry during these years was regarded as the proper domain of private enterprise and, with the exception of petrochemicals, the Government made no attempt to enter the field directly, confining its action to regulatory measures, such as the maintenance of price controls on some products in the internal market, the "mediation" of labor-company collective contracts, and conservation. As late as 1957, the Government was granting new concessions to private companies, among which were many U. S. "independents."

In retrospect, this can be counted as one of the regime's major policy errors, even by those who would agree with the general approach taken. Policy was at its best and most successful in conservation. Constant insistence on good conservation practices built up a general awareness of its importance and may have been largely responsible for the construction of the huge gas reinjection plants on Lake Maracaibo. However, on the negative side, the Government showed an almost total lack of concern over the formation of a body of Venezuelan technicians and over the sad state of the townships (such as Cabimas and Punto Fijo) growing up chaotically around the oil fields and refineries.

There was, in summary, virtually no dynamism in the policy of the old regime, it being aimed rather at the maintenance of a very profitable status quo.

The changes since early 1958 have been for the most part, brusque, basic and probably irreversible. The first radical change, introduced in December 1958, was the drastic increase in income tax rates, which hit the oil industry hard, particularly as it was made applicable to income earned during the whole of that year. The step was taken by the Provisional Government of President Sanabria, but it must have had the blessing of the then President-Elect Romulo Betancourt, to judge from public statements made by members of his Cabinet since he took office, and from the fact that he kept Dr. Jose Antonio Mayobre on as Finance Minister, a post occupied by him under President Sanabria at the time the higher taxes were announced. The new rates have increased the Government's participation in oil profits from about 54% under the old 50/50 formula (which had always meant a minimum of 50% for the Government), to 69% in 1959 and perhaps more in 1960.

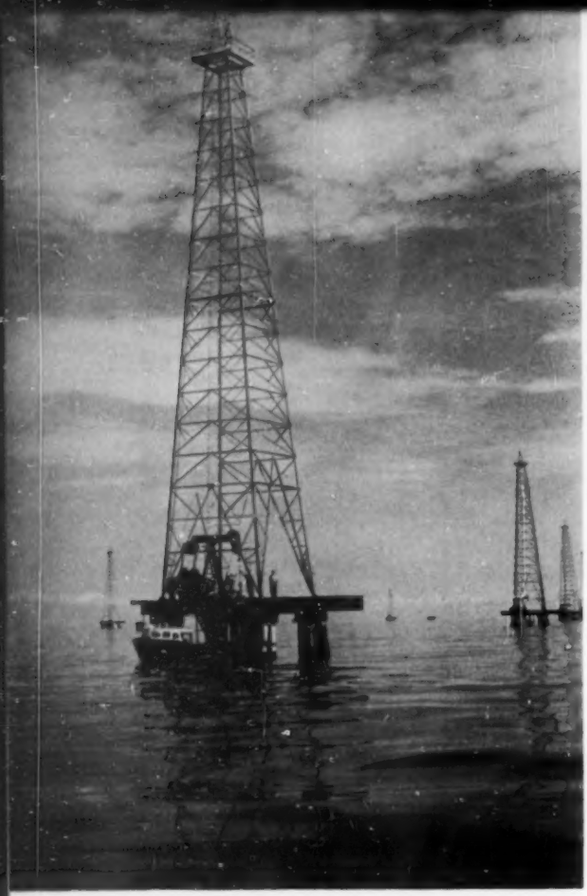
It is impossible to gage the effect of these higher rates with any accuracy, for oil prices began to weaken quite soon after the Suez emergency had been resolved, and by the end of 1958 a collapse to pre-Suez price levels or below was already in the cards. It may be asked, if the new taxes had not been introduced, whether Venezuelan production would have remained virtually static, as it has done, against a background of growing world demand, whether new drilling would have dropped off as drastically, whether so much acreage under concession would have been returned to the Government (thus reducing the payment of surface taxes), and whether crude and products sales realizations would have been as low?

The answer to some of these questions at any rate must be "no," even though their measure cannot be taken. However, it should be remembered, first, that in early 1956, prior to the Suez emergency, Kuwait crude, sold at posted prices f.o.b. the Persian Gulf, could be laid down in practically any of Venezuela's traditional markets at prices lower than similar Venezuelan grades at posted prices. In other words, Venezuelan

◀ *Shell derricks in Lake Maracaibo at Cabimas*

About the author

Francisco R. Parra, a petroleum economist presently in the United States, was associated with Creole Petroleum Corp. from 1951 until recently. Born in Caracas in 1929, he received his early education in England and his degree in political science from the University of Geneva in Switzerland in 1950. His work as a senior economic analyst for Creole covered Venezuelan and world petroleum economics of every type.



Creole derricks on Lake Maracaibo

Venezuelan workmen on an oil rig in Venezuela's rich Lake Maracaibo area

crude was already non-competitive at posted prices. Secondly, the intensive development of producing capacity in new areas, without which the current surplus might have been considered temporary (i.e., short-run), was already well under way by December 1958 in Libya, Algeria, Argentina and off-shore Persian Gulf.

Two immediate conclusions about Venezuelan policy can be drawn from these observations. The first is that no substantial tax relief is likely, since it could not hope to be large enough to make any appreciable difference to the competitive position of Venezuelan crude oil in world markets. Pleas for lowering the tax rate and the high labor costs (a politically impossible step if it means lowering the wage rate or eliminating other benefits) in order to help Venezuela's exporters meet competition will therefore fall on deaf ears.

The second conclusion follows from this; Venezuelan policy must pursue energetically its present aims of (1) price controls among the exporting nations, and (2) a change in the methods of allocating import quotas into the USA as the only ways to prop up sagging oil income.

This is not to say that some measure of tax relief would not be beneficial to both the Venezuelan Government and the oil industry. An inequitable tax structure has peculiarly demoralizing effects. The present formula for calculating Government royalties—i.e., production taxes—and the non-deductibility of certain expenses incurred outside Venezuela would be quoted as prime examples by the oil companies. A healthy relationship between industry and Government (and no country can seriously want its major industry permanently embittered) can scarcely be fostered if company managements are made to feel that no matter how good their cases might be, the Government is always right and always inflexible.

There have, indeed, been some muffled indications that the Venezuelan government is inclined to step down on some tax issues, and Texaco has been granted permission to refine Paria crude in Trinidad without incurring the additional 8% royalty to which it would be subject under the terms of the Paria concession. Unfortunately, the present government came to power only to face the financial chaos left behind by the previous regime and to confront the steepest decline in export sales realization since the war. It has therefore remained in such a precarious economic position that it would take a good deal of political courage to exchange a tangible tax for an intangible "healthy relationship." And how, for instance, would a nationalistic Venezuelan public react to the news of a tax concession to the foreign oil companies at a time when the country has had to swallow the unpalatable medicine of borrowing abroad, in addition to asking the companies for advance payments on royalties and income taxes?

If the 1958 tax increase was the most dramatic of the changes in policy, it was not the deepest nor perhaps the one likely to have the greatest long-term effects. The aim of the government, already alluded to above, to put control over prices in the hands of the principal exporting countries by means of an international system of allowables, was an entirely new departure. Dr. Perez Alfonso, the Minister of Mines and Hydrocarbons, proposed in 1959 that Venezuela and the Middle East States join together to restrict production through a prorationing body, in order to support prices and thus prevent" economic wastage."

Several steps have been taken in line with this thinking. The first was the creation, prior to the Arab Oil Congress in Cairo in early 1959, of a Coordination Commission for the Conservation and Marketing of Hydrocarbons. This body, composed almost entirely of top Ministry officials, was basically created in order to serve as an instrument in the implementation of the new policy. Although no formal action of major significance was taken until last August, pressure was continuously exerted, through the Commission, to cut down on the heaviest discounts (i.e., those in the order of $1/bbl).

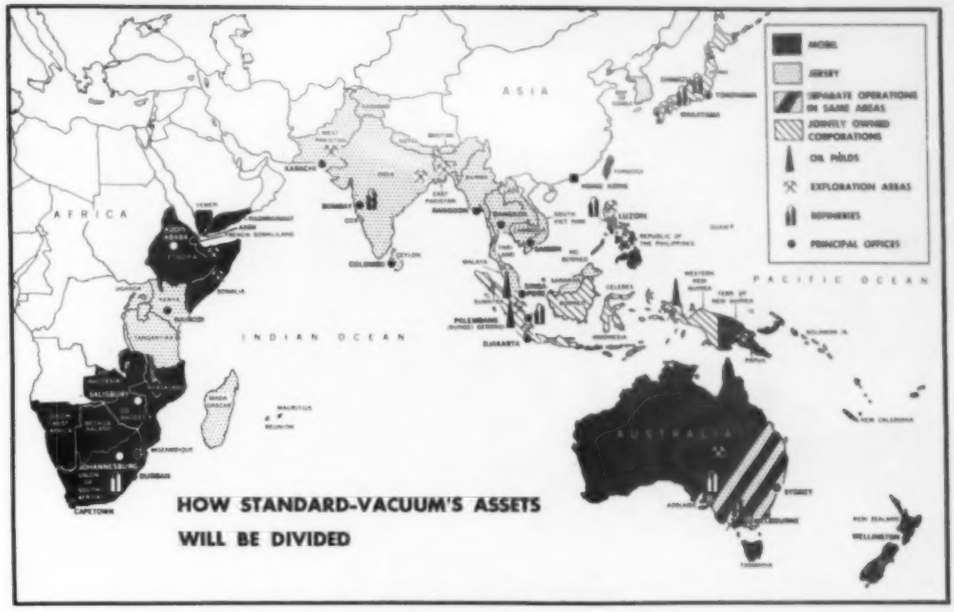
In August, the Minister issued a resolution, approved by the Cabinet, warning that any company allowing discounts which, in the judgment of the Commission, were to be regarded as "abnormal," would have its production closed in on the grounds that such a sale would constitute "economic wastage." Orders had already been given to Superior and Sun to suspend certain large discount sales prior to the resolution, and the Minister himself stated that Venezuela could not allow itself to be drawn into a price-war with the Middle East. In view of Venezuela's competitive situation at that time, this was almost tantamount to saying that no new crude export sales at all could be made except down vertically integrated lines (where the parent company would still prefer to use its own Venezuelan production rather than seek an outside source). However, because of the country's extremely short cash position and internal opposition from some unions which saw their members threatened with unemployment, the government apparently opted for a softer course than the stiff stand taken in its resolution.

The reference to "economic wastage" in the Venezuelan proposals, reminiscent of the example set by some states in the USA, is something more than a thin excuse; Venezuelans genuinely feel that they are working against time and are not disposed to agree that what is good for the oil companies (most of whose concessions, they would point out, expire in the mid-1980's) is necessarily good for the nation in the long run. It was to a large extent this idea of high withdrawal rates, even at premium Suez prices, at the expense of the future that was behind Dr. Perez Alfonso's early insistence that production should not be allowed to rise by more than 4% per year. As it looks now, Venezuela would indeed be lucky to achieve a steady 4% annual growth during the next several years.

After the crude price decrease in August,

(*Continued on page* 85)

A. V. Danner, President
Mobil Petroleum Co.



The end of STANVAC

A SIMULTANEOUS ANNOUNCEMENT by Jersey Standard and Socony Mobil companies on November 14th was the beginning of the end for venerable Standard Vacuum Oil Co. The Justice Department's Anti-Trust Division, under the leadership of the youthful and capable Robert Bix, began the battle, joined in 1953 under an anti-trust charge against five companies, Standard Oil Co. (New Jersey), Standard Oil Co. of California, Texaco Inc. and Socony Mobil Oil Co.

Principal reason for the Stanvac's dissolution was Russian competition, according to Mr. Bix himself. The split-up will give the companies greater flexibility, he said, and make their operation responsible to only one management for tighter and more efficient operation which will meet Russian competition in this fast-moving area.

The way in which the assets of Stanvac are to be split up is shown in the accompanying map, prepared by Socony Mobil. Although the anti-trust case was directed only against marketing operations in countries outside the United States, the split-up goes all the way, and producing and exploration are divided too.

It brings up the next question, what about Caltex? That company is a similar set-up, owned by two parents and marketing for them. There are some differences but the future is in doubt. Nothing will be done at the moment since the present administration is going out of office, but the situation has been under study for some time. American Overseas, the exploration affiliate of California Standard and Texaco, probably won't be affected since it only explores, but who knows? Jersey and Socony went all the way, maybe Texaco and Socal will too.

Only Jersey entered into the consent decree with the U. S. government which terminates, for Jersey, a lawsuit begun against it and the other four companies in 1953. The decree expressly states that it is no admission of any violation of law. While it prohibits a variety of practices, Jersey says these elements of the decree will not affect its business since they were consistent with company practices anyway. Socony said, in its announcement, that it is not (and underlined *NOT*) party to the consent decree, but went along with the Stanvac split because it made their operation more efficient.

Socony's interests derived from the split will be managed by Arthur V. Danner, who will be president of Mobil Petroleum Co., a new company formed to handle them. Esso has formed Esso Standard Eastern, Inc. to handle their portions. Actually, Jersey and Socony have known for some time that the split was coming. It was published in Petroleum Taxation Report more than five months ago(, and they have since conducted their separate negotiations for areas in the Far East.

The change over will be gradual, and so far as the 37,000 employees of Stanvac are concerned, will be almost painless. They have already worked indirectly for one or the other of the partners and this shift will mean employees will have one line of authority, giving a better corporate image to cling to and a single tree to climb.

The change-over will take several years to complete and will mean increased competition for both parents. Stanvac is not as large as Shell in the Far East but is larger than Caltex. It represents the largest single U. S. investment in the Far East of any kind.

Reaction of other companies concerned was mixed. Texaco had "no comment." Gulf Oil issued a statement saying it had agreed to the settlement "in the knowledge that neither Gulf Oil Corp. nor any of its subsidiaries will have to stop or change any present operation nor any contemplated future operation." The company went on to say that "Further, this settlement does not require Gulf or any of its subsidiaries to divest themselves of any stock or assets now in their possession.

"As for the contractual relationship between Gulf and Shell covering the sale of Kuwait crude by Gulf to Shell, the decree does not adversely affect the parties. The provisions of this contract to which the government raised objection have been deleted by the contracting parties.

"As for the provision of the consent decree which require Gulf to make available to so-called independents up to 100,000 barrels a day of Kuwait crude at posted prices, Gulf will be happy to comply as it has sold Kuwait crude to independents in the past and wishes to continue such sales."

END

The picturesque region of Humahuaca, Jujuy Province in Argentina.

ARGENTINA — RISING STAR

President Frondizi's oil policy has raised petroleum production by about one-third, and brought nearly one billion dollars in fresh international oil investment. A major gas line is soon to begin construction, with major efforts underway in exploration and petrochemicals as well.

THE OIL POLICY of President Frondizi has shown startlingly good results for Argentina. Oil production during the first half of 1960 has risen about one-third over the corresponding period in 1959. Both YPF and private company production increased. Two private contractors to YPF, Pan American and Loeb Rhoades, provided together approximately 60% of the national increase.

The January-August 1960 total shows an increase of 31.4% on the corresponding period of 1959; i.e. 4,608,763 cubic meters. The figure for August 1960 is 187,048 b/d, nearly 50% higher than that for August 1959.

Assuming a probable monthly average of 589,050 bbls during the remaining months of the year, the 1960 crude production figure should be nearly 172,603 b/d. This year's consumption of gas is expected to exceed twice that of 1959, which averaged 17,830 b/d petroleum equivalent.

Imports of oil have dropped steadily throughout 1960, affording much relief to the country's hard-pressed foreign exchange budget. Final figures for 1960 are not available, however imports of petroleum products were down 34% during the first quarter compared with the same period in 1959, and YPF was able to announce proudly during March that crude imports by YPF had ceased entirely. There remain some imports of crude by private refining companies, but these too are expected to cease when development of new contract areas has begun.

Oil imports formerly had an average price of $21.29 per cubic meter. This compares with a reported cost of crude extracted by Pan American in the Comodoro Rivadavia zone of $10 per cubic meter; delivered to the YPF refinery at La Plata, the cost is said to be less then $12. The Loeb Rhodes Bank (which produces under contract for YPF in Mendoza) delivers rail-transported crude from Mendoza to the San Lorenzo refinery at about $13 per cubic meter.

Argentina's oil industry was launched into its second stage during early November 1960 with promulgation of a decree opening the "Flanco Sud" or southern flank of the Comodoro Rivadavia oil area—far to the south of the country—to development by private companies, both national and international. This area, formerly the exclusive hunting ground of the government's YPF and also the chief source of its oil production, is probably only the first step in opening the entire country to oil bids. The northern part had already been thrown open

ARGENTINE PETROLEUM PRODUCTION

January-August, 1960
(in cubic meters)

Y.P.F. AND CONTRACTORS	
Comodoro Rivadavia	2,215,304
Pan American (Chubut and Santa Cruz)	558,529
Plaza Huincul	654,857
Northern Zone (Salta)	632,085
Mendoza	1,060,446
Carl M. Loeb (Mendoza)	526,625
Tennessee (Tierra del Fuego)	34,674
PRIVATE COMPANIES	
Shell (C. Rivadavia)	258,724
Astra (C. Rivadavia)	52,429
Petroquimica (C. Rivadavia)	54,100
Esso (Plaza Huincul)	8,178
El Sosneado (Mendoza)	488
	6,056,439
	(38,155,566 bbls.)

by previous decision—and new decrees are expected to take care of the remainder.

This is the latest wrinkle in the oil policy of President Frondizi and his outspoken and highly respected Economics Minister, Alvaro C. Alsogaray. The policy, begun in 1958, has lowered the dangerously high cost of oil imports, made Argentina virtually self sufficient in oil and may soon make the country a net oil exporter. There is strong opposition within the country—YPF's board of directors resigned en masse with the latest decree, for example—but the Frondizi administration has ridden out a succession of crises without a slip so far.

Activity by Yacimentos Petroliferos Fiscales

YPF is operating 74 drilling rigs for its own account, not including any contract rigs. During the first half of 1960 YPF completed 251 wells, of which 197 were oil producers and 54 were dry holes. Total for the country, YPF plus private contractors and companies, was 524 wells during the first half of 1960, which means footage and number of wells will both be about double during the year.

Tennessee Argentina Operations

Tennessee holds the world's title for the farthest south driller in the world, at least for private oil companies. During 1960 the company maintained two surface parties, one seismic crew and four rigs in operation in Tierra del Fuego. Through October, they had drilled a total of 36 wells, principally in the Arroyo Gama and La Sara fields.

In addition to this, all facilities have been built on the island, including tank batteries, terminal facilities and an offshore submarine line for tanker loading. These are being expanded to include additional storage facilities at the terminal.

Tennessee Argentina (subsidiary of Tennessee Gas Transmission Co.) began shipment of oil August 20, 1960, and in October was shipping approximately 10,000 b/d. It is expected that this figure will increase steadily as drilling continues.

Loeb, Rhoades Operations

L. R. Development Co., affiliate of the New York firm of Carl M. Loeb, Rhoades Co., has four rigs running, all of them operated by Kerr-McGee. Three are working in the Mendoza area and one in the south on the company's other contract area. The work is going very fast indeed, with Kerr McGee rigs drilling about two wells per rig monthly. Rigs are drilling around 625 feet per day, with 7,500 foot wells completed in 12 days. The big rigs are moved off the hole after drilling, with small rigs coming on to complete. Through October about 120 rigs had been drilled by Kerr McGee for L. R. Development. The company's production was up to 17,800 b/d in July of 1960.

Kerr McGee Operations

In addition to its work for L. R. Development as a drilling contractor, Kerr McGee has a 500-well drilling contract directly with YPF. For reasons of finance YPF stretched the contract recently and one rig was moved to Bolivia by Kerr McGee, leaving four active. Through October 133 wells had been drilled by Kerr McGee under its contract, a very rapid operation indeed.

Pan American Operations

Pan American Argentina Oil Co., subsidiary of Pan American International, started the Argentine trend when they signed the first of the Argentina production contracts. It was negotiated for Pan American by R. Dunaway, now president of American Independent Oil Co. in the Neutral Zone of the Middle East.

Pan American had completed 180 wells through July 31, 1960, no mean feat in view of the difficult conditions. Two wildcat discoveries had been made, Las Flores with 596 b/d initial production and El Triangulo with 534 b/d. All Pan American's activities are in the Comodoro Rivadavia contract area, which divides into three sub-areas. In Anticlinal Grande field, PAG-15 deep test reached 8,455 feet and was completed in shallow regular pay during January 1960. In 1959 deep tests had been drilled in the Cerro Dragon and Canadon Grande fields which found no commercial oil accumulations below the established producing levels.

Extension wells included San Augustine PSA-1 well, with 192 b/d production, Los Tamaiscos PLT 1 well, which was dry, and Canadon Pedro PCP-1 well, with 392 b/d production. Pan American is drilling new hole with 9 rigs and has four more on completions.

The company has increased its production steadily with completion of a pipeline. Average production during July 1960 was 23,710 b/d, with cumulative production as of 31 July 1960 of 3,705,309 barrels. The pipeline was completed in March, 1960. It is 12¾ inches in diameter from Anticlinal Grande to Cerro Dragon and 14 inches from Cerro Dragon to Caleta Cordova. Total length is 80 miles, initial capacity 50,000 b/d.

The company is operating one seismic crew full time in the contract area and has one surface party in the field.

Wells average 5,785 feet in depth. All are on the pump, or go on pumps in a short time. There is no field stabilization H_2S removal problem.

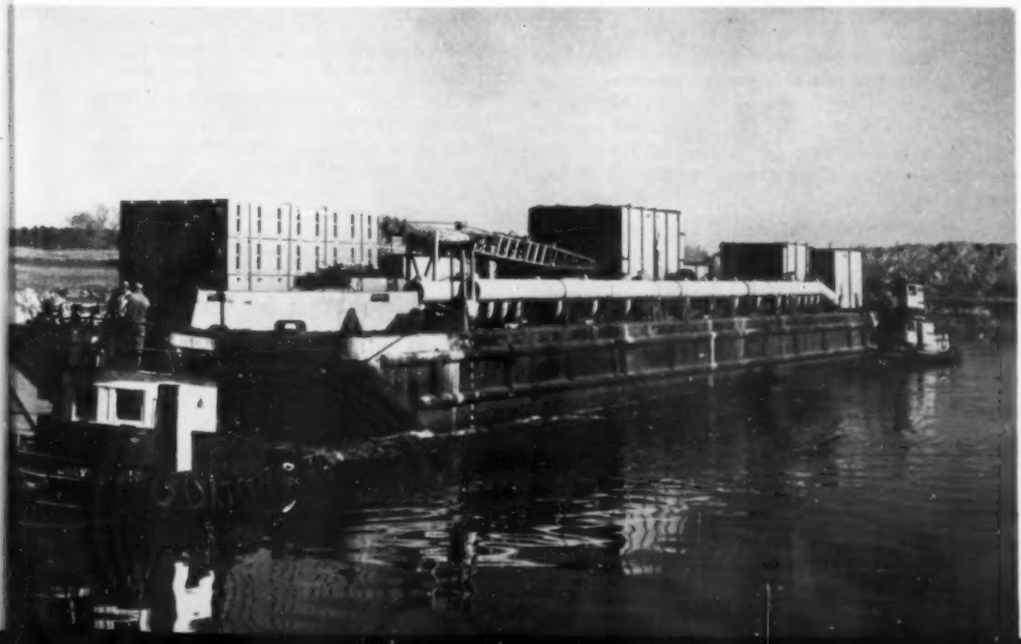
White Eagle Operations

White Eagle International, Inc., signed a 20-year agreement in 1960 to initiate secondary recovery in the Argentine oil properties of Astra Cia. Argentina de Petroles S.A. The contract covers 14,905 acres in the Comodoro Rivadavia area which has produced since 1917. White Eagle has completed its engineering study and is ready to begin an experimental pilot flood.

Operations by Esso SAPA

Under its contract with YPF, Esso carried out delimitation of its contract area in 1959 along with an aerial photographic survey.

The program for 1960 included the drill-



Pipeline lay barge, loaded with equipment and supplies and propelled by tug-boat, left Houston for Tierra del Fuego. Barge will be used by Brown & Root Marine Operators, Inc., to lay a two-mile submarine pipeline from the island to an anchorage in San Sebastian Bay under a contract with Tennessee Argentina, S.A.

Pipe for the Challacó - Bahia Blanca Pipeline being constructed by Esso, for operation by YPF.

WELLS DRILLED BY ESSO SAPA

(As of 30 September 1960)

Well No.	Total Depth	Spudded	Remarks	Status
AT-1	7490'	11/ 7/59	Very small gas prod.	Shut in
AT-2	3752'	14/ 9/59		Abandoned
BMX-1A	8381'	26/ 1/60	Small gas production	Abandoned
BCX-1	10394'	23/11/59	Dry hole	Abandoned
SPX-1	7218'	9/ 4/60	Dry hole	Abandoned
LCHX-1	6494'	31/ 5/60	Dry hole	Abandoned
SPX-2	11609'	10/ 5/60	Gas prod.	Discontinued
BN-2	8140'	16/ 7/60		Abandoned
LBX-1	5705'	30/ 8/60		Abandoned
GU-1	5741'	14/ 9/60	Oil prod.	Completed
SPX-3	6857'	24/ 9/60		Drilling at 4682'
CX-1	—	10/10/60		Drilling at 6897'

ing of 12 exploratory wells using two company rigs the whole year. The 1960 budget covers continuation of the drilling and exploration work, additional facilities at Huincul camp and the purchase of miscellaneous drilling equipment and transportation units. Total expenditures for 1959 and the first semester of 1960 amount to approximately 8,600,000 dollars.

Two Continental-Emeco drilling rigs, one A-800 and one GC-500 and accessory equipment were purchased during February 1959 and have been in operation since the middle of that year.

Challaco-Puerto Rosales Pipe Line by Esso. In accordance with the terms of the basic agreement between Esso and YPF signed in December, 1958, Esso is financing and constructing a pipe line from Challacó to Puerto Rosales to transport the crude oil produced in the area to seaport.

The line is 625 km long and will be constructed with API-5 LX 46, 14-inches O.D. by ¼-inch wall electric resistance welded line pipe, coated, wrapped and buried. There are two crossings, RIO Colorado and Río Neuquén. The head station will be built at Challacó Province of Neuquén, where YPF has an existing tank farm, dehydration plant and RR loading rack. It will consist of three dual-fuel diesel engines driving 3-stage centrifugal pumps through dynamically balanced speed increasing gears. At Puerto Rosales (Isla Cantarelli), Province of Buenos Aires, on the eastern outskirts of Bahía Blanca, a marine terminal will be built to load ocean-going tankers. A tank farm will provide a storage consisting of four welded steel tanks of 15,500 cubic meters each. A cargo loading station will provide a loading rate for tankers of 3,300 cubic meters/hr. Telecommunications will be provided through a single-sideband voice-teletype radio system covering Challacó, Puerto Rosales and Buenos Aires.

The contractor began work on the pipeline on September 15, 1960, clearing right of way, ditching, and stringing the pipe, all of which is stored at railroad sidings between Bahía Blanca and Challacó.

Main line construction will be completed in September, 1961. Construction of the pumping station at Challacó is scheduled to start in January, 1961, with completion in November, 1961. The start-up of operations of the overall project is scheduled to begin in November, 1961.

Operations of Southeastern Drilling Co.

Under its large drilling contract with YPF, Southeastern Drilling Co. of Argentina, S.A., subsidiary of Southeastern Drilling Co. Dallas, Texas, has conducted an intensive drilling campaign. The area is approximately 20 to 25 miles southwest of a little town by the name of Caleta Oliva, on the Atlantic Coast approximately 70 miles south of the town of Comodoro Rivadavia. The work area is within the limits of and adjacent to the YPF-named oil field of Canadon Leon.

At the end of the first contract year, at the end of August 1960, Southeastern had drilled 79 wells of the total of 1,000 contracted to be drilled. Of course during the first contract year, final plans for the design of the rigs, camps and other equipment had to be finished, all of the equipment had to be ordered, accumulated and shipped. Upon arrival of the equipment in Argentina, it had to be transported to the work area from Puerto Dessado and set up. Two drilling rigs and two completion rigs were first shipped and put into operation. Drilling was first started around the first of February, 1960. Additional drilling and completion rigs were added and put into operation so that at the beginning of the second contract year, a total of six drilling rigs and four completion rigs were on hand and all working.

During the months of September and October, 1960, with these six drilling rigs, a total of 44 wells was drilled with the depths varying between 1,400 meters and 1,800 meters.

Saipem Operations

Argentina has doubled the number of wells to be drilled and completed under a contract with a subsidiary of Italy's ENI. The revised agreement with Saipem increases the number of wells in the program from 300 to 600. The work will be carried out on the southern flank of Comodoro Rivadavia field. END

Aramco-government relations seem less strained in this photograph. From left to right are T. C. Barger, president of Aramco, Shaikh Abdullah H. Tariki, head of Saudi Arabia's Directorate General of Petroleum Affairs, and R. Brougham, vice-president of Aramco.

Backstage at Beirut

Government and industry leaders at The Second Arab Petroleum Congress aired their grievances and both benefited. The Russian's badly timed statement of marketing aims aided the oil companies' position

THE SECOND ARAB PETROLEUM Congress was a qualified success and on balance was a benefit to the international oil industry. While some oil company representatives were dismayed by the extremist statements made by Arab leaders, the Congress afforded an opportunity to give vent to these feelings and to some extent relieved them. A succession of parties and dinners given throughout the week gave industry leaders on both government and company sides an opportunity to get acquainted, especially since the Congress was exceptionally well attended.

Over 600 persons participated, with persons in high positions present from both companies and governments. These included the heads of oil departments from the countries concerned, and various oil company presidents, including Christian Dohm, president of Pan American International Oil Co., B. F. Uhl, president of Conorado Petroleum Corp., R. Dunaway, president of American Independent, and many others.

By a last-minute blunder the Russian delegation, headed by Eugenii Gurov, unwittingly contributed to understanding between the oil companies and Arab government officials. The declaration by Gurov came at a particularly important time, when Shaikh Abdullah H. Tariki had just completed reading to the Congress' largest audience his paper, "The Pricing of Crude Oil and Refined Products," which included an accusation that the oil companies had done Arab governments out of five billion dollars through improper pricing systems. A vice president of Aramco, R. I. Broughman, immediately took the floor microphone and read a strong denial of the Tariki charges, which he denounced as untrue. Sheikh Abdullah had begun his reply to the Aramco statement when suddenly two of the three-man Russian delegation arose from the audience and took the floor.

Interrupting Shaikh Abdullah's reply, the lead Russian seized the floor microphone which was located just below the speakers podium, "I am Gurov, chairman of Soyuznefte-export," he declared, in English, and then his aid stepped to the microphone and read a prepared statement in Arabic. It was loud, long and too fast for the simultaneous translation to keep up but the message came home to the listening Arabs.

After a brief sally at "errors" contained in the Shabad paper on Russian oil exports, Gurov reviewed the history of Soviet oil exports. His basic point was that during the 1922-40 period Soviet exports of oil amounted to an average of 14% of Soviet production. In 1959 the Soviet Union exported 14,000,000 metric tons (about 280,000 b/d) of crude and products to capitalist countries, or 10.8% of total production. "We have not entered the market to upset the traditional position of other sellers, but to regain our legitimate position among the exporting nations" he said, which was bad news to his Arab listeners.

There was worse news to come, however. Switching to the crude price level, Gurov stated "The prices at which Soyuznefte-export sells crude oil and petroleum products are in complete accord with the present market price level. It should not be forgotten that at present there are no standard world prices and no standard world market for oil. In fact, there are two markets for oil; a monopolized market which is dominated by eight international oil companies; and a non-monopolized market." He went on to say that his company would sell its products at the free market price, and that it would meet oil company discounts.

This news came as somewhat of a shock to the Arabs whose principal complaint is the recent price cut of Middle East crude oil. The Gurov declaration, made as it was

East meets west as Venezuela's Petroleum Minister, Perez Alfonso (left) stands with Samir Shamma, Arab delegate. Center person is not identified.

PAPERS DELIVERED AT SECOND ARAB PETROLEUM CONGRESS
Beirut, Lebanon

Papers delivered were in two groups, the first dealing with economics and general subjects outside the technical field. The second group dealt with technical subjects only.

First Group
"PETROLEUM ECONOMICS GENERAL AND MISCELLANEOUS"

Title	*Author*
Long Term Demand for Energy and Oil	M. E. Hubbard
Working Conditions of the Venezuelan Petroleum Industry	C. Aguilera
Financial Analysis of Oil Projects	L. Ison
Russia's Potential in Future Oil Markets	T. Shabad
An Approach to International Proration	M. Sladik
The Same World	F. Hyndryx
Current Challenges in the International Petroleum Industry	G. Ballou
Towards Maximizing Oil Revenues with Special Reference to Transit Countries of the Middle East	Z. Mecdashi
Energy for Economic Development	J. Ivers
Pipeline Economics and Technology	P. P. Nibley
A Study of the Arabic Pipelines Project	E. Refaat
I.L.O. Activites Regarding Conditions of Works in the Petroleum Industry	I. A. Ibrahim
Accident Prevention. the Problem and Solution in the Petroleum Industry	C. Homewood
Hygenic and Industrial Health Problems Met with in the Petroleum Companies and their Industrial and Economical Aspects	O. Nashaat
The Legal Frame-work for Oil Concessions in the Oil World	S. Siksek
The Venezuelan Petroleum Corporation	E. A. Acosta J. C. Arreaza
Government Administration of Hydrocarbons in Venezuela	C. Balestrini
The Pricing of Crude Oil and Refined Products	S. Abdulla Tariki

Second Group
"EXPLORATION AND PRODUCTION OF CRUDE OIL"

Research and Its Importance to the Oil Industry	R. A. Morse
Organization Principles for the Petroleum Geology	G. Facca
Exploration Costs of the Western Desert of Egypt	Dr. M. S. Amin
Geologic Observations on the Surface and Subsurface Petroleum Indications in the U.A.R.	M. A. Ghorab
A Review of the Geological Occurrences of Oil and Gas in Qatar	D. Crigain
Geology of the Southern Area of Kirkuk Liwa. Iraq	K. M. el Naquib
Geology of Eastern Nejd	A. Shurrab
Geochemical Prospecting for Petroleum and its Possible Application in the Middle East	Dr. S. M. Solirian
Prediction Technique Applicable to the Venezuelan Petroleum Industry	A. R. Martinez
The Nubian Sandstone Aquifer and its Bearing on the Oil Possibilities of the Western Desert of Egypt	Dr. M. S. Amin

SECOND GROUP *(continued)*

Recent Results of Seismic Reflections	F. Heimburg
Lateral Velocity Variations Across the Qatar Peninsula and Their Effect on the Interpretation of Seismic Results	G. D. Williams
Some Problems of Stratigraphy Structure and Oil Migration Affecting Search for Oil in Iraq	H. F. Dunington
Bakr Oilfield, the Southern Region U.A.R.	T. A. Hadidi
Well Spacing	M. J. Sladic
Oil Field Development and Spacing	H. Shenouda
Drilling Fluid Practice in Zubair and Rumaila Fields	T. Abdel Aziz
Well Logging Methods Used in South East Arabia	D. Crigain
Contribution of the Sonic Log to Formation Evaluation	A. Misk
Associated Gas in Saudi Arabia	A. C. Hill and E. C. Zinola
The Effect of Wettability on the Movement of Oil and Water in Porous Media	Zinzer
Reservoir Performance Under Gas and Water Injections-Abqaiq Field	M. el Aawar
Utilization of National Gas in Saudi Arabia	H. A. Tayem
Gas Injection L.P.G. Recovery and Other Uses of Natural Gas in Kuwait	W. C. Renton B. R. Buther
A Project for Pressure Maintenance in the Kirkuk Field	T. I. Shafik
Estimation of Reserves from Pressure Changes in Fractured Reservoirs	H. Samara
The Development and Use of Specialized Equipment for Reservoir Studies	P. Lane
A Proposed Scheme for Processing Heavy Egyptian Crudes	M. el Orabi
Control of the Properties of Asphaltic Bitumen from Egyptian Crude Oils	M. el Harouni
Hydrogen Treating of Middle East Crude Oil	I. A. Ismail
Petroleum Development in Lybia from 1954 Through Middle 1960	Lybian Petroleum Commission
Galvanic Corrosion and its Prevention	M. el Baggal
The Role of Molecular Spectrocopy in Petroleum Chemistry	G. A. Darwish
Analyses of Light Ends of Gasoline Using Gas Chromatography	F. Masoud and Habib
Amendment of Fuel Oil Characteristics Adding Gas-Oil and Using the Blend as Fuel for Certain Ships	A. H. Omar A. Ammar
The Manufacture of Nitrogen Fertilizer from Petroleum Products	A. Ahmed
Determination of Composition of Mixtures of Organic Liquid by Physical Titration with Water	D. A. Habboush
The Design and Operating Experience of Brackish and Sea Water Demineralizing Plant	L. J. Cotterill
Some Aspects of the Manufacture of Chemicals from Petroleum	E. J. G. Toxopeus
Petrochemical Industries and Their Application in Southern District U.A.R.	H. Abul Seoud

at that sensitive time, did more than any company representative could have done to drive home the hard facts of price competition to the Arab leaders present. For the first time they could see Russian competition as a real force exerting a downward pressure on oil prices. Prior to the Russian declaration the Arab countries had made several statements to the effect that Russian competition was just an excuse by the oil companies to reduce prices. The oil minister of Venezuela, Juan Perez Alfonso, had been particularly specific on the subject. The Russian declaration dispelled all such doubts.

Crude Pricing. Principal interest at the Congress centered on "The Pricing of Crude Oil and Refined Products" by Shaikh Abdullah Tariki. While attendance at many of the previous meetings had been low (some of the technical papers were read to an audience of only a dozen listeners), for the Tariki speech the hall was jammed.

It was an historical analysis of the development of oil pricing, leading up to the present date and taking swipes at the oil companies along the way. "They say we do not understand the oil industry," Tariki said, "but the more we learn about it the more we realize what the oil companies have been doing to us." He then went on to purportedly show how the oil companies had bilked the oil producing nations out of half of $5 billion under a pricing scheme which computed the posted price of Middle East oil to make its delivered price in New York equal to the delivered price in New York of Venezuelan oil. He proposed instead to make London the equalization point, using U. S. Gulf postings. This would accomplish a considerable rise in Middle East postings, but the formula was denounced as "fantastic and unworkable" by oil company representatives. The allegation the companies had made $5 billion "under the table" was likewise attacked. One company representative said, "if there were that kind of money in transportation there would be a lot more companies in the tanker business."

Tariki also proposed that the producing companies sell their stock to shareholders of the producing companies, thus making them independent and better able to "conform with the best interest of their country and its stockholders."

Contracts Attacked. Aside from the Tariki paper interest was aroused by "The Same World," a discourse by Frank Hendry, lawyer for the Saudi Arabian government, which contained the same thesis he voiced in Cairo last year. In fact it was so much the same that another title suggested by Emile Bustani, Arabic contractor, was "The Same Paper."

It aroused much comment from the floor. His statements were supported by an Egyptian, Mahmoud el Hefnawi, who delivered a speech on "rights of the people" and "sovereignty of the nation." Tariki attacked the companies, claiming bitterly that the Arab concession agreements were signed by uninformed governments who did not know the difference between a royalty and income tax and who were now bound not to increase their take over 50%. The Venezuelans backed up this thesis with pointed reference to the need for more than 50% participation by the producing countries and pointing to their own 69% take.

RESOLUTIONS OF THE SECOND ARAB PETROLEUM CONGRESS

The chief delegates of the governments of Arab countries and Amirates to the Second Arab Petroleum Congress, announce the determination of their governments to develop the Arab petroleum industry as to enable this industry to contribute to the fullest, to the increase of the national income of Arab countries and the raising of their standard of living, and to make for the realization of their aims within the frame of a consolidated petroleum policy. Accordingly, their word was unanimous on the issuing of the following resolutions:

FIRST RESOLUTION:

The Congress upholds the demands of the Arab countries and their efforts which aim to improve the terms of petroleum concessions. The delegates express their hope that the companies will respond favorably to such equitable demands to ensure the continuation of a fruitful cooperation between them and the governments to the common interests of governments, companies and consumers as well.

SECOND RESOLUTION:

The Congress disavows the resort of petroleum companies to reduction of the prices of crude oil and its products without the consent of the governments of the Arab producing countries. Also, the Congress upholds the position of these governments, in their repudiation of such reduction.

THIRD RESOLUTION:

The Congress recommends that the governments of Arab Countries will double their efforts for the encouragement by various means of technical, economic and legal studies, and for making available to the sons of Arab countries their participation in the activities of petroleum Congresses.

FOURTH RESOLUTION:

The Congress recommends that it will be convened every year, on Monday of the third week of October of each year, and that the third Congress will be held in Cairo.

Translation by Middle East Economic Survey, Beirut, Lebanon.

There were only two Arabs who spoke up for the companies. One was Simon Siksek, a Lebanese from Palestine, who is a consultant. The Arabs are very sensitive to connections, and seem to consider his paper on oil concession contracts, which ran directly counter to the Hendry thesis, as a contribution paid for by the oil companies. Its content seemed to glance off them utterly and completely, although it was a well-reasoned dissertation. Emile Bustani, pipeline contractor of Lebanese origin is not considered by the Arabs to have sold out to the oil companies because he is already rich, but his position was that of a mediator between the Arabs and the companies. At frequent intervals he seized the microphone on the floor to deliver his opinions in fluent English. On the Arab side in asking for more participation by Arabs in oil and in demanding the Arabs be informed on price changes, he often turned to oppose Tariki's statements, called him "an extremist" and got in disputes with the Russians twice, once on the floor after Gurnov's speech and once with Gurnov at a cocktail party where they shook fingers in each other's face and exchanged threats, with Gurnov shouting "Don't threaten the Soviet Union," to which Bustani replied the next day on the floor with "Don't threaten the Middle East."

An unusual aspect of the Congress was its almost complete lack of interest in any but the most sensational papers. Some grumbling was heard to the effect that Tariki overly dominated the Congress. It is certainly true that he attracted the biggest crowd.

His statements, and those of many other Arabs, showed a resentment of oil company authority and a distrust of oil company statements. "Stop treating us like children!" he exclaimed at one point. A more disturbing aspect is his distrust, for without mutual trust, company-government relations will never improve. It obviously is not true, as Tariki said, that "the oil companies have always lied to us." No big company can lie successfully, operations are just too complicated. The distrust is combined with a surprising naivete history. Almost no Arab sincerely believes that the Standard Oil companies are really separated, and none understood the Russian threat.

One of Tariki's principal resentments is not being consulted about the change in oil prices. Although he is on the board of Aramco, Aramco does not post prices. Instead it sells to its owners who post their own prices. Still, Tariki must have known a change in prices was inevitable. Perhaps it crossed his mind that the longer it was delayed the better. The company pays its share to the government based on posted prices. No one knows how much discounted oil moved out of the Persian gulf before the posted prices were changed but it must have been tremendous. All that cost differential fell on the company.

Would he have felt better about the price changes if the companies had consulted him first? WORLD PETROLEUM put that question to him and got this reply. "I am not so naive. If they tell me, they are asking for my consent and that I would never give."

His statement reflects the desire for all Arab control over the companies. In reply to a question on what he meant by a recent statement that "the oil companies have just five years to go in the Middle East." He said, "I mean just that. They have five years to go unless they change their ways."

Clearly, it is not just "informed" that the Arabs want to be. They want control over prices and with that goes a good share of control over the company's operations. Statements by Arab officials variously use the words "advised," or "consulted" but what they really want is the veto. While oil companies might assent to this if the veto were wisely used, it is almost certain that no government representative could be convinced, even if he understand the situation economically in every way, that a reduction in his country's revenues was essential. Politics simply does not operate that way.

Author of one of the controversial Congress papers, Frank C. Hendryx. Legal advisor for oil since 1957 to Saudi Arabia, Mr. Hendryx was an attorney with Creole Petroleum Corp. before that in Caracas. From 1948 to 1954 he was general counsel for Esso Standard of Brazil in Rio de Janeiro. Before he entered petroleum law, Mr. Hendryx had a private law practice in Atlanta, Washington, New York and Philadelphia.

Shaikh Abdullah had other comments to make on Aramco's operations as well. "Why should they insist on selling for dollars?" he asked. "We don't care if we get yen or pounds or whatever. The machinery we can get from Japan is satisfactory to us. Aramco limits our income by its insistence on receiving dollars for most of its production."

In sum, then, the Congress was worthwhile in affording a closer contact between companies and government officials concerned. It was noteworthy in that the companies began to speak in their own defense at last. The mildness of the final resolutions, however, must be attributed to a combination of factors, including the influence of the Russian statement on prices. It showed, as well, that the Arab countries stand together and form a potent force in the international oil industry. END

Joseph Ellender, Aramco official, is shown addressing the Petroleum Congress at Beirut.

Multiple well location on Magdalena River, Yarigui field. Workmen are unloading ballast for mats to offset river erosion. Shell of Colombia Photo.

COLOMBIA'S OIL KEEPS PACE

Successful completion of several wildcats during past two years promises increased production and oil development in Colombia

by E. Ospina-Racines
Consulting Engineer
Bogotá-Colombia

COMPARED to the century of progress in the oil industry in the USA, the oil industry of Colombia has had a half century of developments. The first two oil concessions were granted in 1905—De Mares and Barco. First drilling for oil took place on the Caribbean Coast in 1907. What are the accomplishments for the Colombian oil industry so far and what is the outlook?

In a half century Colombia has attained in oil output of 155,000 b/d (see Table 1), of which some 52,000 b/d are currently consumed in Colombia and there is a surplus exported which runs from 80,000 to 100,000 b/d including fuel oil. In this day of self-sufficiency and exchange control the fact that Colombia does not have to import some $152 million dollars in oil products per year and is a modest exporter is commendable.

Colombian oil policy toward exploration has historically included the recognition of private oil and the granting of concessions to explore and develop government oil. Secondly, royalty and tax structure as well as labor costs were favorable to capital investment and oil developments, and the crude found a ready world market. Competition is worldwide today and costs are mounting through greater fiscal levies and higher labor costs as well as deeper drilling and greater inland developments. The im-

mediate outlook is one of greater competition but not necessarily of crude oil prices but rather lower costs throughout the industry.

During this first half-century development of Colombian oil, carried out under favorable legal and economic circumstances, exploratory drilling during the 1907-1959 period shows a total of 439 exploratory and wildcats drilled. They resulted in 66 oil, 6 gas, and 367 dry or an overall coefficient of success of 1:8 or 12%. The success ratio averaged 1:12 and compares with the overall risk for the USA during 1944-1958 of 1:13. (See Table 2 and Fig. 1.)

The volume discovered through the exploratory drilling and some 3,200 field wells drilled to the end of 1959 is placed at 1.6 billion barrels of oil, of which 894 million barrels have been produced, leaving today some 700 million barrels of oil reserves.

Since 1931 when the basic oil law was enacted and concessions were granted, cumulative oil output by the various successful operators has been as follows:

	Time Period	Million Bbls.
Tropical (Int'l Pet.)	1921-1951	412
Ecopetrol (State)	1951-1959	94
Colpet (Mobil-Texaco)	1933-1959	161
Shell	1937-1959	168
Texaco	1948-1959	56
Mobil	1934-1957	1.5
Intercol (SONJ)	1951-1959	0.8
Others		.7
Cumulative oil output to 1959		894.0

The record is the discovery of five fields of over 100 million barrels, four fields from 10 to 100 million barrels, and the rest over one million barrels. Currently there are 27 fields which yield—as of July 1960—155,000 b/d.

Data published by the Ministry reveals that from 1931 to 1959, and under the provisions of the Oil Code, a total of 1,110 applications for oil concessions were filed with the Ministry by Colombian and other applicants. Of these only 339 were found in order and accepted; that is, could be converted into concessions. Only 252 of the 339 eligible were granted in concession, in other words, close to 25% of the original 1,110 bids. At the end of 1959 there were 100 concessions in force, about 40% of the ones signed up and about 10% of those originally solicited. Those resulting in commercial oil and granted under the Oil Code total 16, or 6.3% of those signed up and 1.5% of those originally solicited.

Of Colombia's total oil output of 155,000 b/d today, concessions granted under the Oil Code yield 75,709 b/d. The balance is obtained from the Barco concession granted under special contract, the Velásquez fee property of Texaco, and De Mares operated by Ecopetrol through reversion. Concessions are listed in Table 3.

Pipelines operating in Colombia are listed in Table 4. The 20 mmcf/d, $5 million natural gas line listed is being built cooperatively by Colpet (Mobil-Texaco) and Colombian investors. It will run 139.5 miles from the Cicuco field along the Magdalena River to the city of Barranquilla, and will be a great boost to further development.

The mountainous terrain of Colombia has promoted the products pipelines. The Ecopetrol line from Puerto Salgar to Bogotá of 143 kms (87 miles) was the first one built right after World War II. It delivers products from 600 ft. to 8,600 ft. above sea level where Bogotá is located. Originally built through financing by the local government and International Petroleum Co., it has been purchased recently by Ecopetrol for about $6 million dollars. Ecopetrol now operates the products pipelines which deliver from the Barranca refinery to Bogotá—the largest inland market.

Data on drilling which took place last year reveal the maximum yearly activity witnessed in Colombia to date. Six wells resulted in oil and/or gas. (See Table 5.)

Peak drilling activity in Colombia was in 1959 with 1,200,000 ft in 59 wells drilled by 12 different operators. Current drilling to September 5, 1960 is listed in Table 6 with seven operators—although through drilling contracts and farmout there are actually ten firms financing drilling in Colombia.

Four notable discoveries have been made during the first nine months of 1960 (Table 5). One of the most interesting and important is the Guavio 1 discovery completed dually by Texaco in the foothills of the Eastern Cordillera—Llanos area only 65 miles east of Bogotá. The well was spudded June 20, 1959, and completed July 21, 1960 and taken down to 10,592 ft. Loffland Brothers, the contractors, flew in all the equipment and rig material and later had

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The Oil Policy of Colombia

by Dr. Jose Elias del Hierro, Minister of Mines and Petroleum of Colombia

Following is a statement for WORLD PETROLEUM *by Dr. Jose Elias del Hierro, Minister of Mines and Petroleum of Colombia, chairman of the Board of Empresa Colombiana de Petroleos.*

"Colombia has had a definite oil policy with respect to its oil resources, based on the granting of oil concessions on the terms prescribed by its oil legislation which regulates the various phases of oil exploration, exploitation, and its economic situation. Colombia has fulfilled its obligations, it enjoys a traditional respect toward the rights which the Constitution grants to those who establish themselves in the country and foreign capital, foreign know-how, and the personnel of other countries which works in Colombia may feel absolutely sure it will enjoy full guarantees of these rights. The desirable aspect of those relations is that they should be maintained on the basis of equitable and just principles, which have no substitutes in order to prolong this cooperative situation in the future."

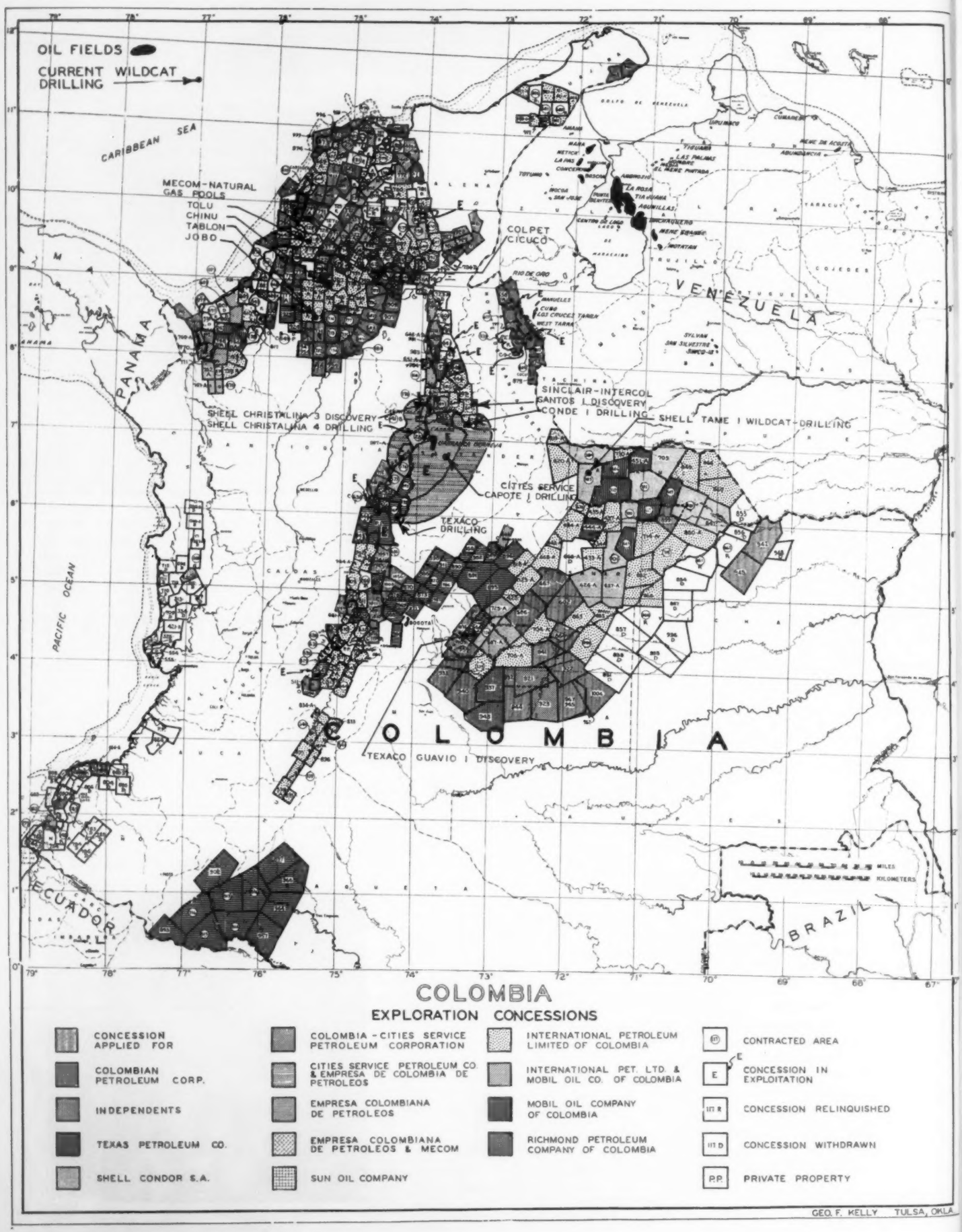
OIL FIELDS
CURRENT WILDCAT DRILLING
CARIBBEAN SEA
MECOM-NATURAL GAS POOLS
TOLU
CHINU
TABLON
JOBO
COLPET CICUCO
VENEZUELA
PANAMA
SINCLAIR-INTERCOL SANTOS I DISCOVERY
CONDE I DRILLING
SHELL CHRISTALINA 3 DISCOVERY
SHELL CHRISTALINA 4 DRILLING
SHELL TAME I WILDCAT-DRILLING
CITIES SERVICE CAPOTE I DRILLING
TEXACO DRILLING
PACIFIC OCEAN
BOGOTA
COLOMBIA
TEXACO GUAVIO I DISCOVERY
ECUADOR
BRAZIL
MILES
KILOMETERS
COLOMBIA
EXPLORATION CONCESSIONS
CONCESSION APPLIED FOR
COLOMBIAN PETROLEUM CORP.
INDEPENDENTS
TEXAS PETROLEUM CO.
SHELL CONDOR S.A.
COLOMBIA - CITIES SERVICE PETROLEUM CORPORATION
CITIES SERVICE PETROLEUM CO. & EMPRESA DE COLOMBIA DE PETROLEOS
EMPRESA COLOMBIANA DE PETROLEOS
EMPRESA COLOMBIANA DE PETROLEOS & MECOM
SUN OIL COMPANY
INTERNATIONAL PETROLEUM LIMITED OF COLOMBIA
INTERNATIONAL PET. LTD. & MOBIL OIL CO. OF COLOMBIA
MOBIL OIL COMPANY OF COLOMBIA
RICHMOND PETROLEUM COMPANY OF COLOMBIA
CONTRACTED AREA
CONCESSION IN EXPLOITATION
CONCESSION RELINQUISHED
CONCESSION WITHDRAWN
PRIVATE PROPERTY
GEO. F. KELLY TULSA, OKLA.

Table 1—Colombian Crude Oil Production, 1960
(b/d average)

Month	Ecopetrol	Texas	Colpet	Shell	Intercol	Nuevo Granada	Total
Jan.	27,674	39,577	49,142	39,943	436	145	156,917
Feb.	27,388	38,828	49,176	39,744	452	66	155,655
Mar.	27,446	38,384	50,041	38,865	398	92	155,226
April	27,170	38,751	51,644	38,699	362	131	156,758
May	27,720	39,744	49,652	37,700	380	210	155,406
June	28,098	39,889	50,058	37,164	384	283	155,876
July	28,138	40,610	46,474	39,107	357	175	154,861
Aug.	25,692	40,443	7,238	37,590	283	202	111,448*

*Drop in August due to strike in Colpet fields Aug. 5 to Sept. 6.
Official Ministry data includes condensate and LPG blended with crude.

Colombia's Oil Industry—Government Data for 1959

Crude production: 55,574,112 bbl; 146,778 b/d.
Oil refined: 24,207,896 bbl; 66,323 b/d (45% of crude produced).
Consumption: 18,328,655 bbl; 50,215 b/d (34% of crude produced).
Fuel oil exported: 4,130,058 bbl; 11,315 b/d (8% of crude produced).
Crude exported: 28,522,371 bbl; 78,143 b/d (53% of crude produced).
Condensate: 793,336 bbl; 2,174 b/d.
LPGas: 305,168 bbl; 836 b/d.
Est. consumption imported lubes & greases, 240,000 bbl; 658 b/d.
Wells spudded: 216 total; 39 wildcats and 177 field.
Wells completed: 221 total; 36 wildcats and 185 field.
Footage drilled, 1,220,796 total; explor., 281,405; field, 939,391.
Rigs operating Dec. 31: 25 total; 11 wildcat, 14 field.
Persons employed: 12,946; males—12,126; females—820.
Total salaries plus wages: Pesos 198,275,672.
Crude transported by pipelines: 53,416,356 bbl; 146,346 b/d.
Oil fiscal income taxes & royalties (est.): Pesos 212,000,000, or about 66¢ per U.S. bbl. produced.

to resort to helicopter transportation under most difficult climatic conditions. Guavio 1 was completed dually-upper zone IP (initial production) 216 b/d of 39° API oil on 24/64-in. choke, and lower zone IP 338 b/d of 38° API oil on same choke.

The Guavio block was solicited in concession as early as 1937—the first one in the Llanos of Colombia. Due to the war and other local factors, the first well was not spudded until 1959 although the block was contracted August 1951.

Other operators have drilled farther east in the Llanos—notably Shell, Intercol and Mobil. All told, some 30 wells were drilled without success. Shell has just spudded its Tame 1 wildcat, which is located in block 585 near the Barinas-Colombian border north of Guavio 1.

Sinclair has been bold in its exploration and most successful, having just completed its Santos 1 in a farmout block from Intercol. The well was drilled to 9,964 ft. and completed dually. The pay is reported to total some 350 ft, but only two zones were tested. The lower IP was 845 b/d on ¼-in. choke of 36.1° API oil, and the upper IP was 144 b/d on ¼-in. choke of 32.4° API oil. The well is said to be good for some 3,000 b/d, which is a big well anywhere in the Western Hemisphere. An outpost well in another farmout block from Intercol is now drilling southerly in the adjacent block Conde 1 now below 5,365 ft.

Shell is drilling an outpost Cristalina 4 in view of the No. 3 success as noted. Mecom has been successful in proving up a big gas field in Tablon farmout block from Intercol. The latter is now building a $13 million petrochemical plant at Cartagena on the coast which will use initially some 5 mmcf/d of refinery gas, and could eventually tap these natural gas sources which are not located too far from the petrochemical plant. The plant will produce fertilizers for the most part for domestic and export markets.

Mecom has also proved up greater gas reserves in Chinu farmout block from Richmond near Tolu where he has drilled and proven up the Tolu gas structure in a farmout block from the state oil agency Ecopetrol which holds the blocks in concession. The agreement is Mecom-Ecopetrol 75-25 capital investment and the same split of the oil and/or gas with Mecom paying a 5% overriding royalty above the 13% royalty established in law.

Exports in 1959 averaged 78,100 b/d of crude, fetching a weighted average price of $2.56 per bbl. fob. (See Table 7.) This volume is unlikely to increase significantly to be a factor in world oil marketing—although Colombia is one of the few oil exporting countries.

Oil industry employment totaled in 1959 12,946 persons who were paid in cash some pesos 200 million or 30 million dollars. The net profit split between the oil operators and the government has averaged greater than 50-50 in favor of the government—resulting in a unit payment ranging from 66 to 83¢ per bbl. produced.

Table 2—Wildcat Drilling in Colombia, 1907-1959

Years	Completions: Oil	Gas	Dry	Total	Pools Discovered: Commercial	Non-Comm.	Total	Ratio of Discovery Coeff. of Success	Risk Incurred
1907-57	55	4	314	373	23	18	41	1:9 (11%)	1:13
1958	6	1	23	30	2	4	6	1:5 (20%)	1:7
1959	5	1	30	36	4	2	6	1:6 (16%)	1:9
1907-59	66	6	367	439	29	24	53	1:8 (12%)	1:12

Table 3—Oil Properties Held in Concession in Colombia—June 30, 1960

Operator	No. of Properties: Exploration	Exploitation	Area in Hectares: Exploration	Exploitation	Total Area Acres
International Pet. Co.	26	3	1,360,384	58,148	3,503,774
Empresa Colombiana de Petroleos[1]	4	1	171,393	512,000	1,687,980
Magdalena Oil Co. (J. W. Mecom)[2]	2	0	79,540	0	196,463
Mobil Oil Co.	2	0	299,273	0	739,204
Texas Petroleum Co.[3]	19	5	1,553,269	237,116	4,422,250
Colombian Petroleum Co.	7	3	347,579	286,744	1,566,777
Ambassador Oil Co.	1	1	9,785	15,108	61,485
Shell Condor S.A.	16	4	1,324,674	163,894	3,676,762
Richmond Petroleum Co.	12	0	542,250	0	1,339,357
Independents	2	2	78,523	49,835	317,044
Colombian Cities Service[4]	Several		782,870	0	1,933,688
Total	91	19	6,549,540	1,322,845	19,444,784

[1] Includes DeMares producing property of 512,000 hectares which reverted in 1951.
[2] Mecom area farmout from Ecopetrol.
[3] Includes Velasquez fee property of 127,205 hectares.
[4] Colcitco areas are farmout from Ecopetrol, not held in concession by Colcitco.
Authority: Division Nacional de Petróleos, Ministry of M. & Petroleum.

Table 4—Pipelines Operating in Colombia, Sept. 1960

Operator	Terminals: Initial	Delivery	Length (Kms.)	Diameter (Inches)	Capacity (b/d)	No. of pump stations
CRUDE OIL PIPELINES						
Andian	El Centro	Mamonal	538	10 & 12	78,000	18
Sagoc	Tibú	Coveñas	409	12	27,000	3
Texas	Anisales	Guamo	34	4	3,400	1
Shell Condor	El Difícil	Plato	85.5	6 & 10	13,200	1
Texas	Puerto Niño	Dorada	74	4 & 6	4,000	1
Shell Condor	Cantagallo	Puerto Wilches	2.5	4	1,000	1
Texas	Velásquez	Galán	181	12	30,000	1
Intercol	Aguachica	Puerto Mosquito	17	4	5,000	1
Intercol	Totumal	Puerto Mosquito	19	4	5,000	1
Colpet	Cicuco	El Retiro	16.5	4	4,800	1
Texas	Palagua	Velásquez 26	8.5	6	3,000	1
Ecopetrol	El Centro	Galán	26.8			1
Shell Condor	Casabe	Galán	10	10	60,000	1
PRODUCTS PIPELINES						
Ecopetrol	Galán	Cantimplora	96.8	8	24,000	1
Ecopetrol	Cantimplora	Puerto Berrío	5.5	2 & 6	15,400	1
Ecopetrol	Cantimplora	Puerto Salgar	146.5	8	19,000	1
Ecopetrol	Puerto Salgar	Bogotá	143.0	6	12,000	3
Antioquia	Puerto Berrío	Medellín	180.8	6	8,300	3
Pacífico	Buenaventura	Yumbo	98.0	8 & 6	28,000	2
Colpet	Tibú	Puerto León	70.0	3		1
NATURAL GAS PIPELINE (Building)						
Gasnatco	Cicuco	Barranquilla	224.8	10¾	(20 mmcf/d)	1

Texaco's Guavio 1 discovery, in Llanos foothills 65 miles east of Bogota. Loffland Bros. were drilling contractors. Photo: Texaco in Colombia.

Table 5—Oil or Gas Discoveries in Colombia—1959

Operator	Location	Depth ft.	Status
Ecopetrol	Lisama 4	15,556	Good pay below 14,000 ft. Abandoned due to poor completion.
Texaco	Baúl 3	5,341	Pumper, 14° API, 100 b/d.
Texaco	Magdalena 1	2,791	Pumper, 13° API, 42 b/d.
Colpet	Zenon 1	6,422	Flow, 100 b/d.
Shell	Cristalina	11,110	Flow, 900 b/d, 28° API.
Mecom	Tolú 1	9,326	1,367 mmcf/d dry gas.
Intercol	Cachirá 1A	12,456	Pumper, 120 b/d, 19° API.

1960 Promising Discoveries (to Oct. 1, 1960)

Texaco	Guavio 1	10,592	Dual; 216 b/d of 39° API, 338 b/d of 38° API.
Sinclair	Santos 1	9,964	Dual; 845 b/d of 36.1° API, 144 b/d of 32.4° API.
Mecom	Tablón 3	8,193	3 mmcf/d on 1/4-in. choke, gas.
Mecom	Jobo 4	6,879	4.86 mmcf/d, gas well.

Table 6—Colombia Drilling and Production Report, as of Sept. 8, 1960

Operator	Property	Well	Depth, ft.	Weekly footage	Status
Ecopetrol	Colorado	57	6,118	0	Testing, Fractured C-Zone.
		54	4,912	906	Drilling.
		60	4,344	965	Drilling.
	Galán	74	6,700	0	Testing.
	La Cira	1741	4,050	4,050	Spudded Sept. 10; suspended Sept. 16. Development. R.T.E. 298 ft. (est.). Water injection.
	Llanito	7	8,105	0	Testing.
	Vizcaina	1	5,778	673	Drilling.
				6,594	weekly footage. Active rigs—9; Explor.—1; Field—4; Serv.—4.
Texas	S-M	10	7,640	930	Drilling.
	Velásquez	178	8,407	401	Drilling.
		183	3,961	3,961	Spudded Sept. 12; 9⅝ in. at 735 ft. Development.
	Dos Hermanos	1	1,679	1,679	Spudded Sept. 11; 13⅜ in. at 885 ft. Wildcat.
				6,971	weekly footage. Active rigs—10; Explor.—2; Field—2; Serv.—6.
Colpet	Tibú	347	2,330	2,330	Spudded Sept. 12. Drilling.
	Cicuco	11	8,225	0	Rig released Sept. 15; GOR 1476; Grav. 42.7 API. Test: E 104 BO, 20 BW (16.1%) in 12 hrs. 1/4-in. choke.
		23d	8,215	0	Completed Aug. 3; flowing on general production. Development.
				2,330	weekly footage. Active rigs—5; Field—2; Serv.—3.
Shell	Cristalina	4	11,172	832	Drilling. Made Schlumberger electrical survery at 10,730 ft.
	Tame	1	1,876	1,669	Drilling.
				2,501	weekly footage. Active rigs—6; Explor.—2; Serv.—4.
Intercol	Conde	1	8,000	1,224	Drilling. One active, explor. rig.
Colcitco	Capote	1	11,178	1,446	Drilling. One active, explor. rig.
Mecom	Tablón	3	8,193	0	Completed Sept. 8. Coordinates (Gauss): N—1,443,790.98, E—854,398.52. One active, explor. rig.
TOTAL COLOMBIA				21,066	weekly footage. Active rigs—33; Explor.—8; Field—8; Serv.—17.
TOTAL COLOMBIA (previous week)				13,872	footage.

According to a recent economic survey of Colombian oil industry and its role in the general economy of the country, in 1958 the Colombian oil industry contributed $99 million dollars to the gross national product, made up of purchases of Colombian goods and payment of services tax and royalty payments, customs, wages and salaries, fringe benefits, private oil royalty payments, leases and interest payments.

The study reveals that actual cash wages represent only 66% of the total payments to personnel. Another conclusion from the study is that oil during 1950-1957 made available $184.6 million in dollar exchange, the value of oil exports amounting to $430.2 million during this time. Capital imported amounted to $688.1 million dollars. The oil industry contributes about 15% to the yearly fiscal budget, which amounts to $360 million annually now.

Summing up, the first-half century of oil in Colombia was carried out under an enlightened oil policy, contained in the oil code of granting oil concessions and recognizing private oil property. During the first quarter century of Colombian oil when the De Mares concession was developed, production was obtained with a minimum capital investment, a small local demand, a ready world market and a handsome yield to the operator. The second quarter to date of concession granting has been characterized by bold exploration, huge investments, a modest yield to the operators and greater income to the fisc. Bills introduced to Congress recently would change the general oil policy of the Government with the aim of obtaining greater oil income. The period we are now in is one of greater competition, reduced world markets, unstable price structure, and high investment due to deeper drilling and greater inland location of the fields being sought. It is not propitious for the Colombian government to seek greater income per barrel but rather greater income from a greater oil output, maintaining the oil legislation as is, in view of the returns to the state and to the economy of the country as described.

(Continued on page 57)

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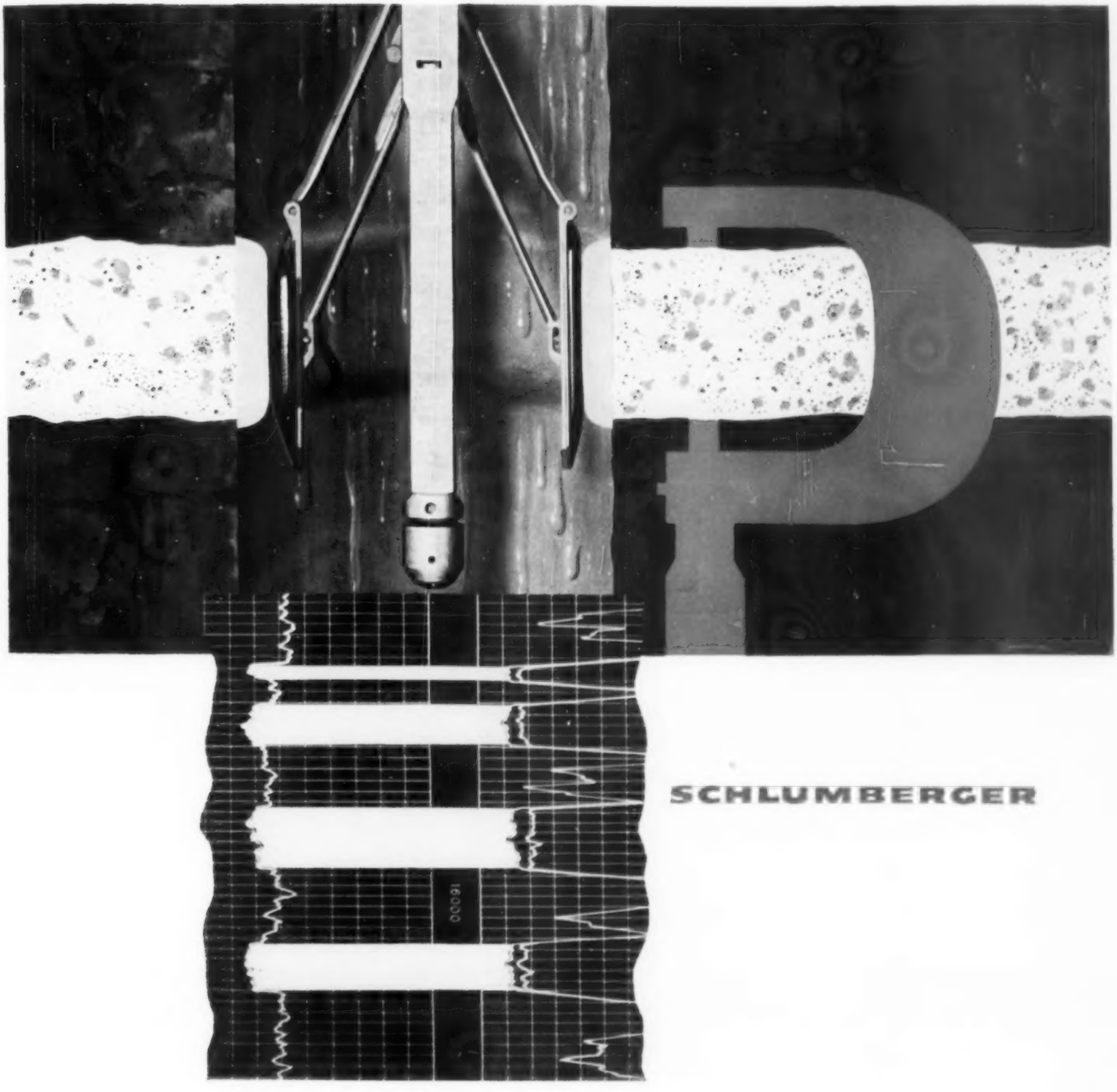

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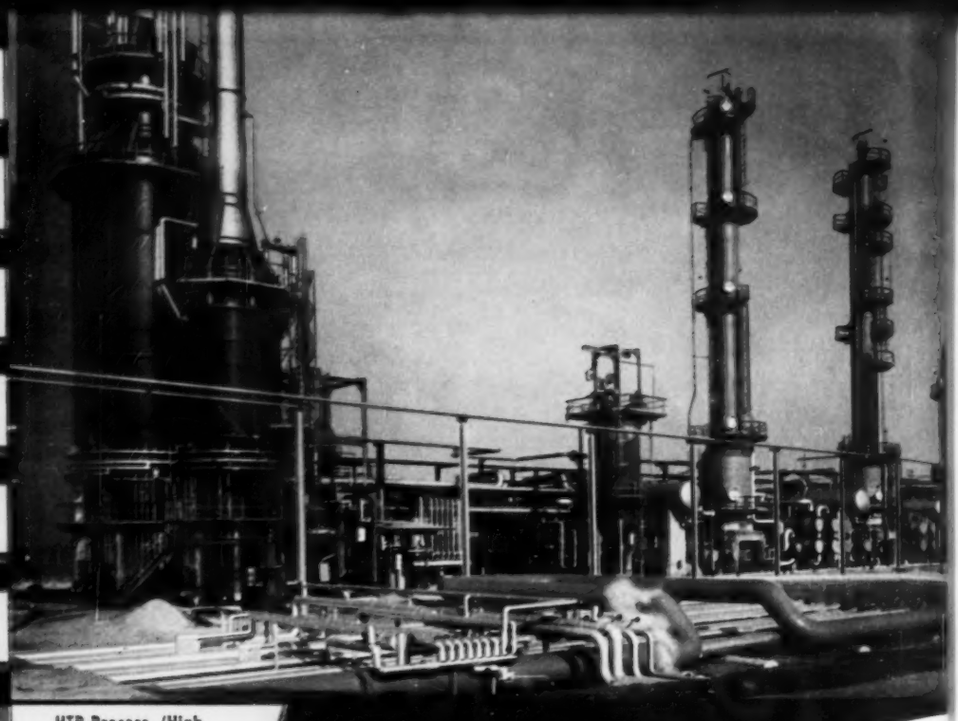
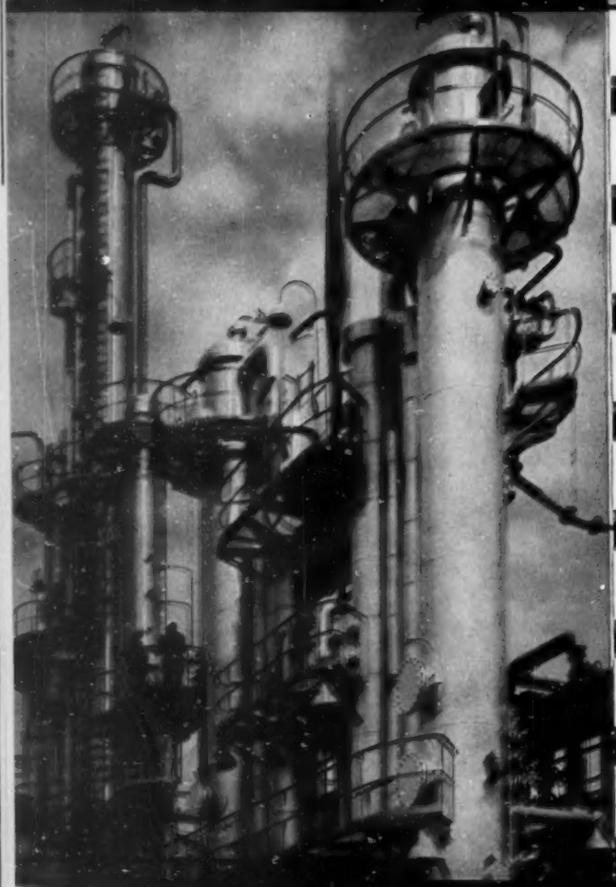


- Gas
- Motor fuels
- Gas oil
- Lube oil
- Fuel oil
- Asphalt



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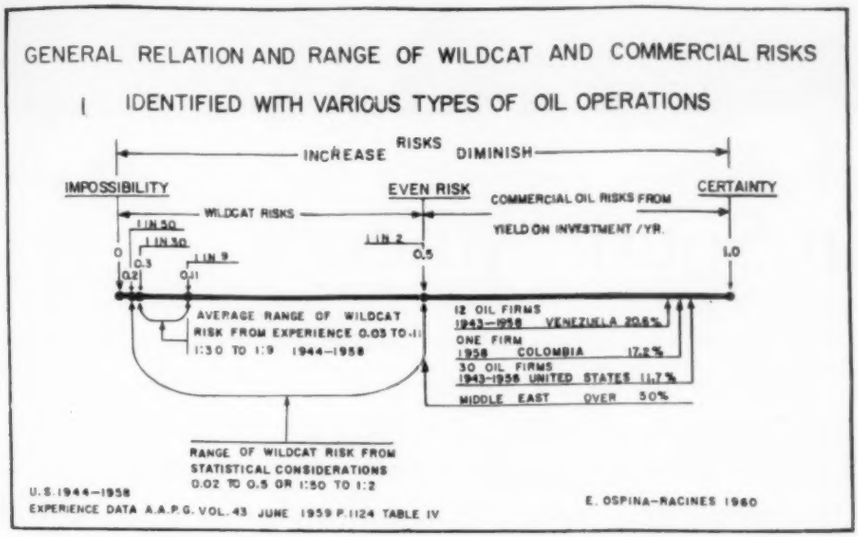
COLOMBIA'S OIL KEEPS PACE

(Continued from page 54)

Dr. Augusto Barrientos, Engineer Director of the National Petroleum Division of the Ministry of Mines and Petroleum of Colombia

Dr. Ramiro Lobo, Petroleum Engineer of the Conservation, National Petroleum Division of the Ministry of Mines and Petroleum of Colombia

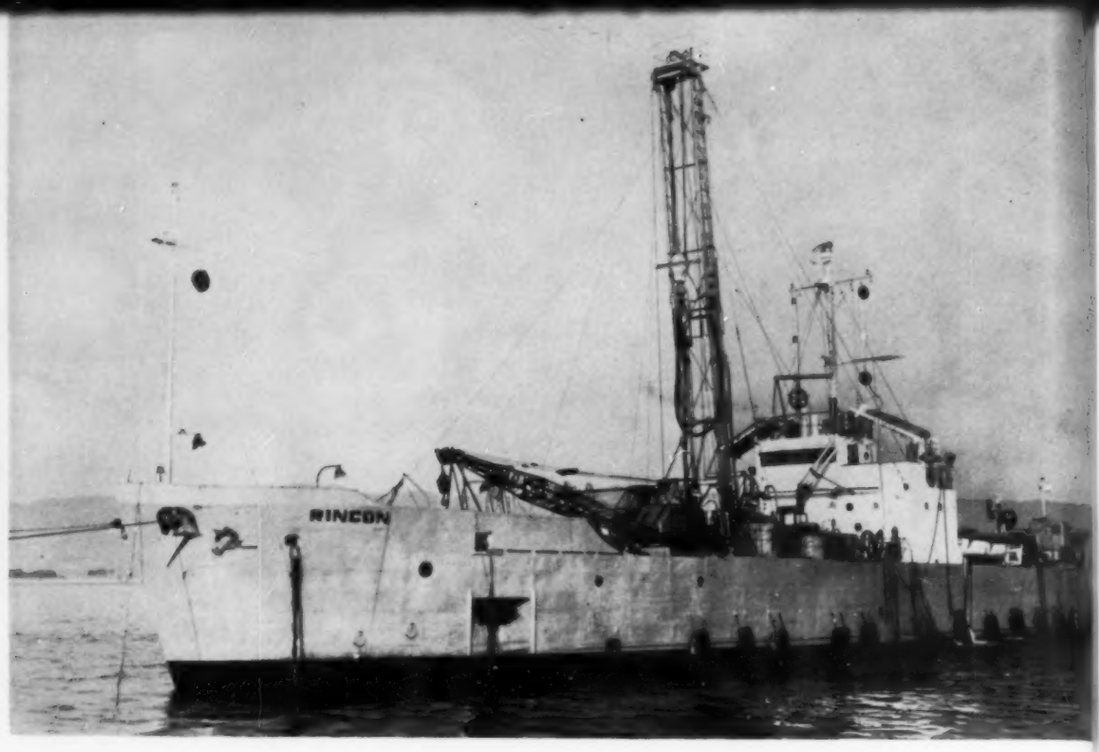

GENERAL RELATION AND RANGE OF WILDCAT AND COMMERCIAL RISKS
IDENTIFIED WITH VARIOUS TYPES OF OIL OPERATIONS
INCREASE RISKS DIMINISH
IMPOSSIBILITY
EVEN RISK
CERTAINTY
WILDCAT RISKS
COMMERCIAL OIL RISKS FROM
YIELD ON INVESTMENT /YR.
1 IN 50
1 IN 30
1 IN 9
1 IN 2
0
0.3
0.2
0.1
0.5
1.0
AVERAGE RANGE OF WILDCAT RISK FROM EXPERIENCE 0.03 TO 1:30 TO 1:9 1944–1958
12 OIL FIRMS 1943–1958 VENEZUELA 20.8%
ONE FIRM 1958 COLOMBIA 17.2%
30 OIL FIRMS 1943–1958 UNITED STATES 11.7%
MIDDLE EAST OVER 50%
RANGE OF WILDCAT RISK FROM STATISTICAL CONSIDERATIONS 0.02 TO 0.5 OR 1:50 TO 1:2
U.S. 1944–1958
EXPERIENCE DATA A.A.P.G. VOL. 43 JUNE 1959 P.1124 TABLE IV
E. OSPINA-RACINES 1960

Santos 1 wildcat in middle Magdalena Valley, completed for 1,000 b/d from two pay zones. Photo: W. O. Clift, Sinclair Colombian Oil Co.

Left: Fig. 1—The risk incurred in search for oil in USA is shown as a range from 1:30 to 1:9 trials. In Colombia, the experience as per data in Table 2 shows a similar range, from 1:30 to 1:8 trials. This is a qualitative scale-comparison. The conclusion from these data is that if the risk incurred in wildcatting for the two countries is about the same, qualitatively, bigger pools must be found abroad in view of the same effort and risk. The greater yield on the investment abroad must be assured. Chart by the author, from June 1960 Bulletin of the American Association of Petroleum Geologists.

Table 7—Colombian Oil Industry Data—1959
(Oil Ministry Data, U.S. Barrels)

Operator	Property	API Crude	Fiscalized Oil Output—Bbls.	Average b/d	Pipeline Deliveries Bbls.	Pipeline Deliveries b/d	Runs to Stills Bbls.	Runs to Stills b/d	Crude Exports—FOB Bbls.	Crude Exports—FOB Dollar Value	Unit Price FOB per bbl
Ecopetrol	De Mares	24.1	9,876,888	27,060	10,732,239	29,403	9,805,916	26,865	—	$ —	$ —
Colpet	Barco Light	46.4	2,259,376	6,190	2,225,969	6,099	14,785	40	2,084,050	6,743,639.37	3.23
	Barco Heavy	31.4	6,843,669	18,750	6,568,507	17,996	967,400	2,650	6,474,125	18,040,475.18	2.78
	Total Barco	—	9,103,045	24,940	8,794,476	24,095	982,158	2,690	8,558,175	24,784,114.55	—
Colpet	Cicuco	43.8	6,109,504	16,738	6,121,435	16,771	392,711	1,076	5,377,723	17,392,507.68	3.23
	Violo	39.2	3,345	9	3,280	9	—	—	—	—	—
Shell	Yondo	20.7	8,279,810	22,684	8,153,056	22,337	246,077	674	7,975,824	16,567,225.24	2.07
	Difícil	51.0	338,726	928	254,285	697	—	—	316,337	1,142,604.76	3.61
	Cantagallo	20.4	912,803	2,501	908,558	2,489	—	—	886,465	1,839,168.72	2.07
	San Pablo	20.2	4,091,155	11,209	4,054,134	11,107	—	—	3,905,456	8,093,713.46	2.07
Texaco	P.P. Guaguaquí-Terán	23.8	10,430,513	28,577	10,082,988	27,625	8,462,424	23,185	1,502,391	3,472,424.59	2.31
	Palagua	15.4	3,569,410	9,779	3,494,427	9,574	3,510,290	9,617	—	—	—
	Tetuán	25.5	462,253	1,266	460,819	1,263	460,247	1,261	—	—	—
	Ermitaño	16.2	203,215	557	179,499	492	176,853	485	—	—	—
	Sogamoso	27.3	49,493	136	44,262	121	43,692	120	—	—	—
	Baúl	14.2	1,717	5	629	2	629	2	—	—	—
Intercol	Totumal	26.8	40,152	110	40,182	110	41,277	113	—	—	—
	Aguachica	38.0	22,477	62	22,437	61	22,437	61	—	—	—
	P.P. Trinidad y Lagunitas	38.5	11,976	32	12,926	35	11,498	32	—	—	—
	La Gironda	18.5	7,364	20	4,887	13	—	—	—	—	—
N. Granada	Lebrija	26.3	59,493	163	51,837	142	51,687	142	—	—	—
Amkirk	Floresanto	43.0	773	2	—	—	—	—	—	—	—
	Totals: 1959	—	53,574,112	146,778	53,416,356	146,346	24,207,896	66,323	28,522,371	73,291,759.00	2.56
	1958	—	46,899,719	128,495	45,862,397	125,650	23,565,441	64,562	23,819,154	65,093,644.00	2.73
	1957	—	45,744,446	125,327	42,704,926	127,113	18,376,296	50,346	26,964,332	72,331,680.00	2.68



The 600-ton drilling barge "Rincon," owned by Richfield Oil Corp., was used for drilling and completion on the ocean floor of the Humboldt 3-3 well. The converted LSM has been in Peruvian waters since early 1959 when it was towed from California for use by Peruvian Pacific Petroleum Co.

Oil struggle in South America

South America's west coast is a land of contrasts. Ecuador invites oil companies to try again to find oil, while Peru threatens nationalization of her largest producer. Colombia benefits from Venezuela's adversity while Chile continues on a level keel with her first mainland production this year.

by Dr. J. E. Rasmuss

On the west coast of South America oil development in Chile, Peru and Colombia showed steady progress in 1960. In Ecuador and Bolivia it remained stagnant, but the entering of new companies should increase and strengthen exploration. The problem of over-supply, which is threatening development in many parts of the world, does not affect the Pacific coast of South America because of the strong and rapidly raising local demand, and crude prices have remained steady.

Low ceiling prices for products, imposed by the government, which handicapped last year development in Peru and Ecuador, have been lifted. Now, however, an opposition party in Peru is using oil as a political football and is attacking International Petroleum Co., principal oil producer of the country, and the oil policy of the government. The progressive and realistic government, aware of the necessity of a free and healthy industry, has sought to avoid measures, which would endanger Peru's oil development and her free economy.

Chilean Oil on Mainland

In Chile, the political and economical situation has remained stable under the new independent government. Crude output of Empresa Nacional del Petroleo, the autonomous government entity and the only producer, increased in 1959 by 16% to 1,021,989 cubic meters or 6,428,106 bbls, an average of 17,611 b/d against 15,254 b/d in the preceding year. In the first half of 1960 output amounted to 549,932 cu. m. or 3,459,070 bbls. Average daily output increased to around 19,000 b/d. Cumulative output of Magellan fields, including the first half of 1960, exceeds 31.2 million bbls. since its discovery in 1945. Highest yield in 1960 was provided, as in former years, by the Cullen field with 223,241 cubic meters, or 7,818 b/d in the first semester of 1960. Cumulative output of the Cullen field amounts to 8.7 million bbls. Sombrero field, the second largest producer with a cumulative output of 7.5 million bbls so far, declined to only 2,647 b/d. Manantiales, the discovery in 1945, yielded around 230 b/d in 1960.

Most important achievement was the extension of the Magellan fields from the island of Tierra del Fuego to the continent, north of the Magellan Strait, at Punta Delgada. Punta Delgada and Punta Delgada Este yielded in the first 6 months of 1960 an output of 18,853 cubic meters or nearly 120,000 bbls against 150,000 bbls for the entire former year and only 2,500 bbls total in 1958. Two new discoveries, Daniel and Posesion, were added in July 1960, to the continental fields north of the Magellan Strait, and an inclined well from the coast of the continent at Faro proved oil also below the sea of the Strait.

An 8" pipeline from Punta Delgada to the Gregorio terminal on the continental coast, 34 miles long, started operation in July 1960. Exploratory drilling on the mainland farther west to the foothills of the Cordillera, has so far only struck gas in the tertiary beds.

90 wells were completed in 1959, of which 26 yielded oil, 15 gas and 49 remained dry. In the first semester of 1960 22 wells were completed, of which 12 yielded oil, 2 gas and 8 remained dry. Only 4 rigs were active instead of 5 in the former years, and the number of completed wells was considerably smaller, but the success ratio increased remarkably. Of the new wells 7 were exploratory, of which one yielded oil and one gas, of 12 development wells only one remained dry and of 3 ex-

tension wells, one struck oil and two remained dry.

Total number of wells drilled in the Magellan fields to July 1, 1960 amounted to 537, of which 204 yielded oil, 88 gas and 245 were dry, a success ratio of around 60%. While total footage drilled in 1959 amounted to 189,090 meters or around 620,000 feet, total footage for the first semester 1960 reached only 56,114 meters or around 170,000 feet. Average depth was 7,700 feet.

At the end of last year 100 wells were producing, of which 92 were flowing and average yield per well amounted to around 170 b/d.

In the Magellan region 3 seismic crews and 3 geological crews were active in exploration in 1960, and one seismic, one gravimetric and two geological teams in northern Chile in the province of Tarapaca, where drilling of an exploratory well is scheduled for the near future.

Domestic demand in Chile amounts to 42,000 b/d and capacity of the national refinery at Concon, north of Valparaiso, was doubled in 1959 by M. W. Kellogg Co., to 44,000 b/d at a cost of around $15 million. Crude processed at Concon refinery amounted in 1959 to 945,297 cubic meters or nearly 6 million bbls, of which 68% were from domestic production. In the first 6 months of 1960 crude processed amounted to 821,940 cubic meters or 5,160,000 bbls, of which about 3.3 million bbls were domestic crude.

The products line of 10¾" and 75 miles long from Concon refinery to Maipu, a suburb of Santiago, was completed in 1959.

Capacity of the Manantiales plant in Tierra del Fuego was nearly doubled and construction of a new gas and gasoline plant at Cullen at a cost of 5 million dollars, projected and supervised by Hudson Engineering Corp., has begun.

Progress of Empresa Nacional del Petroleo has been rapid and steady, due to good management and direction, but reaching the target of satisfying the yearly increasing demand of the country would certainly be facilitated by the cooperation of private industry.

Conflict in Peru

In Peru after renewing of drilling by International Petroleum Co. in Brea-Pariñas and Lobitos fields in August 1959, crude production increased, reaching, in January 1960, around 51,700 b/d of crude plus 2,735 b/d of condensate. However total output for 1959 declined by nearly 6% from 51,320 b/d in 1958 to 17,725,847 bbls or 48,464 b/d in 1959. In addition, there was a natural gasoline production of around 1 million bbls or about 2,700 b/d from International's Brea-Pariñas and the Lobitos fields, including a small share of some 10,000 bbls total from Empresa Fiscal. Recovery of natural gasoline in Brea-Pariñas averaged 1.53 gal per 1,000 c.f. of gas, and in Lobitos to 1.41 gal.

The largest increase in production was from the Lobitos fields, also operated by International, which surpassed Brea-Pariñas fields output, yielding 24,400 b/d in July 1960 against 695,907 bbls or 22,460 b/d from Brea-Pariñas. Lobitos Oilfields Ltd. in London, the parent company, after a long loss period due to unsatisfactory ceiling prices, could again distribute dividends to its shareholders.

Total production of International Petroleum Co. for the first six months of 1960 amounted to 4,143,106 bbls of crude plus 382,555 bbls of condensate from its Brea-Pariñas field and to 4,120,970 bbls of crude plus 112,699 bbls of condensate from the Lobitos fields.

Empresa Petrolera Fiscal's output reached at the beginning of 1960 a high of 90,000 bbls monthly or around 3,000 b/d, but dropped later on to about 80,000 bbls monthly, yielding an output of 79,105 bbls in August 1960. Output for the first 6 months of 1960 amounted to 501,061 bbls, an increase of nearly 9% against the output of 928,516 bbls for the entire year 1959. Petrolera Fiscal is preparing to drill a wildcat at Zarumilla, near the Ecuadorian frontier in the northernmost section of Peru's coastal area.

Petrolera Amotape's output, which joins the Lobitos concessions, amounted to 33,257 bbls total in the first semester 1960. Total output in 1959 was 72,480 bbls. The company completed in August well C 20, farther west near the coast. It reportedly yielded about 200 b/d from only 1,200 ft depth. Well C 22 completed in October had a similar output in the same shallow depth of the Upper Eocene Verdun sands.

Belco Petroleum Corp. of New York has been very active. Since acquiring the holdings of Petrolera Peruana and starting drilling at the end of last year, it completed 14 new wells in the Mirador field. It also drilled 7 inclined offshore wells from the coast, of which 4 are producing. Output in July was about 1,200 b/d. Production for the first 6 months of this year has been 97,195 bbls. For drilling in deeper water Belco leased the drilling boat Rincon from Richfield and drilled two wells offshore of which one yielded 700 b/d initially. The second is now being completed.

Ganso Azul Co. in eastern Peru's Amazon basin produced a total of 431,366 bbls in the first half of 1960 which is about 8% increase against the total yearly output in 1959 of 804,175 bbls or 2,203 b/d.

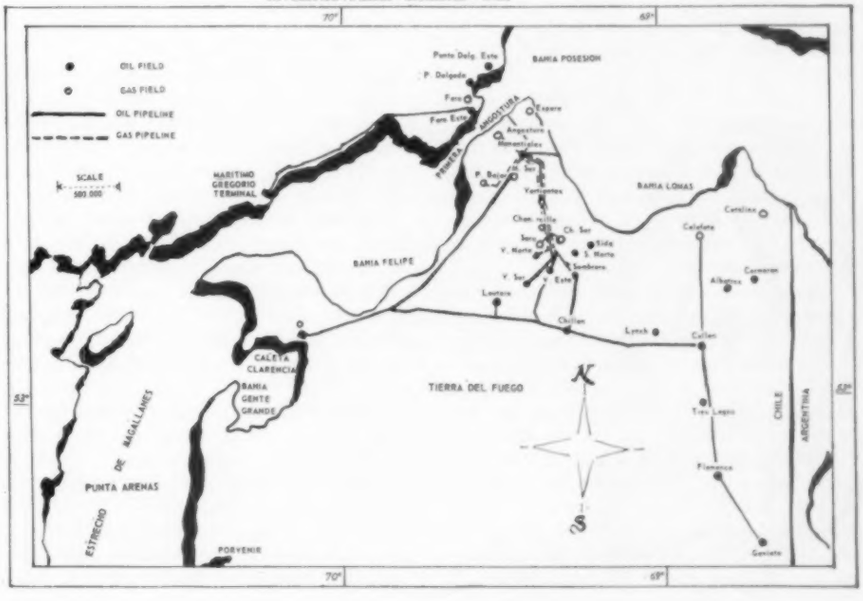
Oriente Co.'s Maquia field started production at the end of last year, after having acquired two 8,000 bbls barges for transport. It shipped at the beginning 500-700 b/d, increasing output later on with shipping facilities. Potential output amounts reportedly to 1,500 to 2,000 b/d.

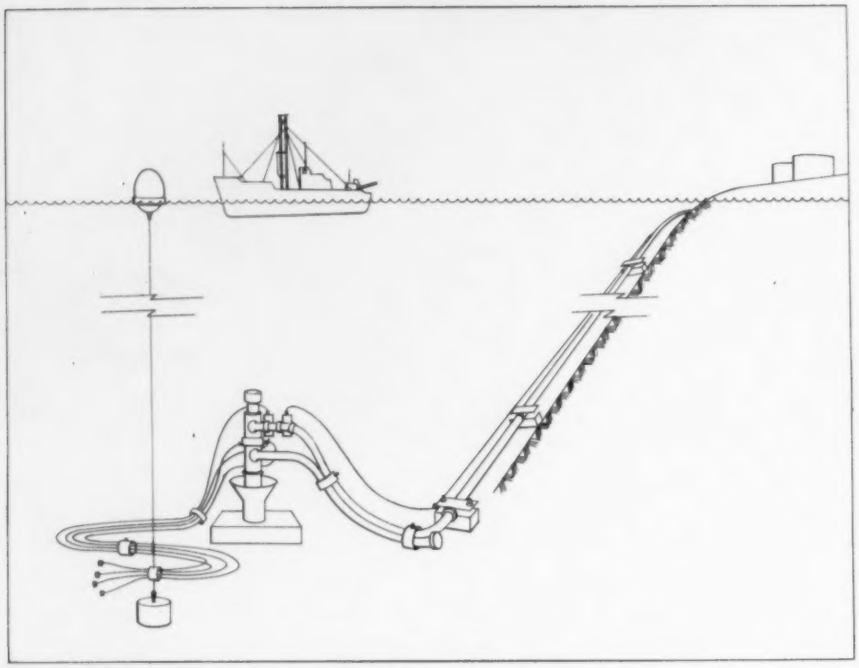
Total crude production in Peru increased in the first semester of 1960 to around 9.5 million bbls, an increase of about 8% against the preceding years average.

Drilling activity in 1959, because of the long suspension by International, dropped sharply to only 65 completions, of which 9 were dry. Footage declined in 1959 about 50% to 284,200 ft. In 1960 International completed in Brea-Pariñas 16 new wells in the first 6 months, of which 13 were producers and 4 wells for water flooding. Nearly 42,000 bbls of sea water are injected daily, and additional recovery amounts to about 3,000 b/d of crude. In Lobitos, International completed 23 wells, which all were producers. Total producing wells decreased to 1,299 plus 10 gas wells in Brea-Pariñas and 744 wells in the Lobitos fields against 1,763 and 925 at the end of 1959, but the average yield per well increased correspondingly. Total producing wells in Peru decreased to around 2,250 in 1960 against 2,900 at the end of 1959, but output was higher, due to improved operation.

EMPRESA NACIONAL DEL PETROLEO

OIL FIELDS AND PIPELINES • MAGALLANES • CHILE





Ocean floor wellhead on Peruvian well is depicted above. Hoses on the left, tied to buoy, are control hoses used in bringing the well into production from the drilling barge. They are left plugged on the ocean floor to be used in case remedial work is required. Plugged line tied to the oil line that runs to shore is installed for possible later use in artificially lifting oil from the reservoir. Top of wellhead is 12 ft. off ocean bottom.

In exploration the most significant feature was the activity of Peruvian Pacific Petroleum Co., subsidiary of Cities Service and Richfield, on the Peruvian continental shelf. The company enlarged its offshore concessions in the north to 50 km. distance from the Ecuadorian boundary (the 50 km. frontier zone in Peru is excluded for foreign companies) by leasing about 680,000 acres from Empresa Fiscal and abandoned its entire concessions on the mainland. Its drilling boat RINCON completed in 1959 five offshore wells over 6,000 ft in depth, of which three struck oil with a yield from 200 to 400 b/d. The company renewed drilling in April 1960, completing 5 additional wells, one also exceeding 6,000 ft depth.

Well Humboldt 3-3, about 1,000 ft deep and producing 200 b/d was connected by a submarine pipeline 6,200 ft long from the wellhead in 132 ft water depth with the storage tanks on the coast. It thus saved the heavy expenses of a marine platform used in the States and Middle East in offshore exploration.

Almost the entire Peruvian shelf from the mouth of the Chira river to the Ecuadorian frontier belt is now covered by concessions.

In eastern Peru's Amazon basin Cerro de Pasco Petroleum Corp. is actively continuing exploration in its concessions in the southern Ucayali region. It is flying in equipment for its first wildcat on the Iscozazin structure, which will be spudded shortly. Mobil Oil Co., associated 50-50 with the German companies, is preparing the drill site on a well developed structure in the Aguaytia region, near the mouth of the San Alejandro river west of Pucallpa, which is the first drilling venture by Mobil in Peru's Montaña. Drilling equipment is arriving by river at Iquitos.

Empresa Petrolera Fiscal has been authorized by the government to renew drilling in the region of the Titacaca lake. There, at Pirin, is the highest oilfield in the world, where at about 13,000 ft of altitude, some 300,000 barrels of oil in shallow wells were recovered 50 years ago by an enterprising Chilean company. Later drilling by Empresa, 20 years ago, was unsuccessful, but because of local demand in this remote region even a reduced output would be important. In cases of success building of a local refinery at Puno is considered.

Peru's local demand is estimated for 1959 at nearly 45,000 b/d. Refining capacity will be shortly expanded to 60,000 b/d. Besides enlarging International's refinery at Talara to 45,000 b/d, a new national refinery of 12,000 b/d will be constructed south of Lima itself in Conchan on the coast at km. 29 of the Panamerican highway. The cost of 15 million dollars has been financed by a local banking group of Prado in connection with the Bank of America. Standard Oil of California will undertake the construction. Bids were scheduled for November 1 of 1960.

The 1,500 b/d topping plant of Empresa Fiscal in Iquitos is supplying the reduced local demand of eastern Peru's Montaña of some 600 b/d, processing crude from Ganso Azul and Maquia field.

General economic conditions in Peru have largely improved under the new Cabinet. The budget has been balanced, inflation halted and the dollar exchange rate stabilized. Dollar inflow has raised considerably and the trade balance has become positive. A bitter discussion has been aroused in Congress and in public, fostered by the principal opposition paper, concerning the validity of Standard N. J. subsidiary, International Petroleum's Brea-Pariñas concession. By an arbitration act of the International Court at the Hague in 1922 it had been exempted from taxation, except surface rentals, a decision often considered unjust by public opinion. However, the government at that time imposed an export duty of 33% on the exported oil.

International Petroleum, on occasion of the enactment of the new petroleum law in 1952, had requested the adjustment of its concessions to the new law, but which never has been approved. In September 1960 the government submitted a bill to Congress to grant to the company a new 30 years concession, with a possible extension for 10 years more. After this period all oil wells and fixed installations, including Talara refinery, would revert free of cost to the government—similar to the elapsed concession of Tropical Oil in Colombia.

Other provisions call for reduction of the concession by 66,456 hectares to a maximum of 100,000 hectares; an initial payment of 300 million soles (about 11 million dollars); an additional bonus of 34,750,000 dollars, to be paid in annual installments during the 30 years period; a royalty of 10%; an export tax of 33%; an income tax split of 60-40 in favor of the government—instead of the 50-50 of the Peruvian oil law of 1952; no depletion allowance (15% is established in the 1952 oil law); cession of a 50 meters strip extending inland from the high tide mark on the Brea-Pariñas concession for military reasons; and some additional minor provisions. Reinvestment of 50% of profits and amortization, and reduction of exports to 20% of output, for safeguarding domestic supply, are required. International Petroleum Co. agrees to a revision of concession conditions, but has objected to the cession of a great part of its concession and to the taxation, which would make further development impossible.

Opposition of the Left parties are combatting the bill, requesting the cancellation of the concession, and are conducting an irresponsible press campaign. However the government in the session of Oct. 12 received in Congress an overwhelming vote of confidence regarding its oil policy.

Oil Invitation in Ecuador

In Ecuador oil production, hampered by low ceiling prices, declined in 1959 by nearly 10% to 2,822,955 bbls or 7,734 b/d. Anglo Ecuadorian Oilfields, including Carolina Oil Co. and Petropolis Oil Co., two local producers at Sta. Elena, operated also by Anglo Ecuadorian, raised slightly its output from 6,600 b/d to 6,828 b/d. Tennessee del Ecuador, subsidiary of Tennessee Gas Transmission Co., which entered the country in 1958 and acquired the holdings

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of Manabi Exploration Co., produced only 330,735 bbl or 906 b/d.

In March 1960 Anglo Ecuadorian produced 199,463 bbls, Carolina Oil 11,106 bbls, Petropolis Oil 3,006 bbls and Tennessee 22,610 bbls or a total of 236,185 bbls from around 1,600 producing wells, an average of scarcely 5 b/d per well.

Drilling dropped sharply from 42 completions in 1958 to only 29 last year. Anglo Ecuadorian drilled 19 wells, all producers, and Tennessee 10, of which 8 remained dry.

Ecuador's large tertiary coastal belt, with a sedimentary sequence of marine tertiary deposits up to 30,000 ft thick, offers attractive geological prospects, and economic conditions are favorable. The highest royalty amounts to 11%, decreasing with distance from the coast, and the income tax is low.

Ceiling prices for products were raised in July 1959, but production has remained restricted to Santa Elena peninsula, where the Paleocene Atlanta sands around 4,500-5,000 ft depth yield the bulk of output in Ancon field of Anglo Ecuadorian and the Tigre field of Tennessee. Widespread wildcatting in the middle and northern area has so far been unsuccessful.

Tennessee drilled two wells in Manabi, in the region of Manta, where International about 20 years ago had drilled 3 wildcats, but both were abandoned. It drilled two wells in the Daule basin in the region of Balzar, but both remained dry. Tennessee holds concessions in Santa Elena peninsula, in the Daule basin, in Mantas and Esmeraldas province in a total extension of 1,215,000 hectares or around 3 million acres and is continuing geological surveys in Esmeraldas.

California del Ecuador, subsidiary of Standard California, holds about 3 million acres and has carried out extended geological, geophysical and seismic surveys. It drilled two offshore wells in the Gulf of Guyaquil to a depth of 4,400 and 4,107 feet respectively, of which one reportedly had oil shows, but both were abandoned. A wildcat on Puna island struck basement. California has now suspended operations.

United Fruit Co. through its subsidiary Agrippa has taken around 1.5 million acres east of the Gulf of Guyaquil and the mouth of the Guyas river.

The largest concession of 3,180,000 hectares, comprising acreage southeast of the Gulf of Guyaquil and extending from Guyaquil to the north to south of Esmeraldas and comprising the Minas concession on the coast, west of Esmeraldas, is held by The National Company, whose merger with Standard Magnetite Co. of New York is proposed. The new controlling company intends to start drilling in Esmeraldas.

After raising the ceiling prices, the new refinery of Anglo Ecuadorian at La Libertad of 7,000 b/d was completed at the end of last year. The topping plant of Tennessee in its Cautivo field has been enlarged from 800 to 1,600 b/d.

Ecuador's increasing domestic demand amounts to about 8,500 b/d. It requires imports, and pushes further development of its oil prospects.

Bolivia Has Discovery

In Bolivia rapid and successful development by YPFB, the government agency, has been hampered by continuous political unrest and financial difficulties. Oil output declined from 9,413 b/d in 1958 to 8,685 b/d in 1959, and remained on a level of some 8,000 b/d in 1960. From the total output of 3,170,115 bbls in 1959 the principal share of 84% was provided by the Camiri and Guairuy fields, which yielded 7,280 b/d from 75 producing wells, or nearly 100 b/d average per well. The Itapirenda structure between both has also proved productive. Second largest producer was the Toro-Bermejo field in the south on the Argentine boundary with 1,319 b/d from 26 producing wells. The small Sanandita field remained stagnant with around 90 b/d, but deeper drilling to the lower Devonian block is projected.

Of 26 wells drilled in 1959 by YPFB 20 yielded oil, one gas and 5 remained dry. Total footage amounted to 138,688'.

The private companies, which hold around 30 million acres of concessions, continued actively geological and geophysical surveys, employing over 30 crews, and have drilled so far 14 wildcats.

Most active operators has been Bolivian Gulf Oil Co., which employed three rigs and completed 8 wildcats, two on the Carandaiti structure at Mandyapecua, two at El Cedro and Yoay in Santa Cruz region to 14,861 and 15,257 ft respectively, Parapeti and Mitaigua, the latter to 12,000 ft depth and Victoria 1 and 2 in the Camiri region. Some of them tested gas or oil shows. A recent small discovery was made, however, in a wildcat 30 miles northeast of Santa Cruz at 5,800 ft. It yielded 325 bbls per day.

Chaco Petroleum Co., operating the former McCarthy concession, drilled two dry wildcats on the Agua Salada overthrust on the Chaco border to 9,532 and 14,958 ft depth. A third well at Palo Mercado is drilling.

Bolivian Oil Co. of Fish Engineering Co. and associates was successful in its first well in the Madrejones concession, leased from YPFB, south of the McCarthy concession on the Argentine boundary. The well yielded reportedly about 3,000 b/d in the test. Final depth was 13,667 ft. Two more wells are expected to strike also oil. The crude will be transported by the new pipeline built also by Fish Engineering Co. from the neighboring Campo Duran field in Argentina to the refinery of San Lorenzo north of Rosario in Argentina.

Bolivian California, subsidiary of Standard California and Shell are preparing drilling by a new light rig, transported by air.

Under the new government of president Paz Estenssoro, elected for second time, the political and economical situation should improve and remain stable.

Colombian Discovery

In Colombia crude output increased in 1959 by about 14% to 53,574,112 bbls or 146,778 b/d. It increased further in 1960 to around 156,000 b/d average. Largest producer, by virtue of its new Cicuco field, was Colombian Petroleum Co. with 41,687 b/d in 1959. Production rose further into 1960 to around 50,000 b/d, supplying nearly 1/3 of Colombia's total output.

Texas Petroleum Co. increased its output in 1959 by over 20% to 40,320 b/d. It made a minor discovery in its Baul 3 well, 5,184 ft deep, yielding about 100 b/d.

Shell, formerly the largest producer, made an important discovery by its Cristalinas 3 wildcat, 11,000 ft deep, which yielded 900 b/d flowing.

Empresa Colombiana de Petroleo, the government company, maintained more or less its output of 27,000 b/d from the De Mares concession, which has yielded already more than 500 million bbls. of oil. Forrest Oil Co. activated second recovery by water flooding, and drilled the deepest exploration well in Colombia, Lizama 4 to the Cretaceous. It was abandoned at 15,556 ft.

International Petroleum Co.'s production remained reduced to some 200 b/d. Its wildcat Cachira yielded reportedly 120 b/d of heavy crude from the Cretaceous.

John W. Mecom of Houston got in the Tolu concession on the Caribbean coast a dry gas well of reportedly 2 million c.f., and still higher gas output at Jobo, about 60 miles south.

Nueva Granada, subsidiary of United Fruit Co., produced a total of around 60,000 bbls in 1959 from the Lebrija field.

Drilling and exploration activity in Colombia was very active, favored by the unstable situation in Venezuela. In April 1960 a number of 23 rigs were active. 219 wells were completed in 1959 with a total footage of 1,205,382 feet. At the end of last year 2,077 wells were producing in Colombia, with an average yield per well of 70 b/d.

Most important discoveries were made in 1960, when Sinclair Colombian Oil Co., associated with British Petroleum, after having drilled two dry wildcats in the Magdalena valley, brought in its well Santos 1, a farmout from International, at a depth of nearly 9,000 feet. Yield exceeded 2,000 b/d of light crude from two different oil sands.

Still more important is the successful completion of Texas Petroleum Co.'s wildcat Guavio 1, about 65 miles east of Bogota in the foothills to the Llanos region, where the equipment had to be flown in. Also from two different sands, about 6,900 and 7,700 ft depth, it yielded reportedly around 700 b/d of light crude. It marks the first discovery in the vast Llanos region of eastern Colombia, east of the Cordillera.

The wildcat at La Heliera in the northern Llanos, south of Venezuelas Barinas basin, drilled by Mobil Oil and Shell at a cost of more than $3 million, was dry and abandoned at 8,961 ft depth, after having reached the basement of Lower Paleozoic rocks. END

SWANSEA HARBOUR SOUTH WALES

This ingenious new fire-fighting float, the "BP Firemaster", was designed by BP. It can deliver 3,100 gallons of water a minute at a pressure of 100 pounds per square inch, or alternatively 12,500 gallons of foam a minute.

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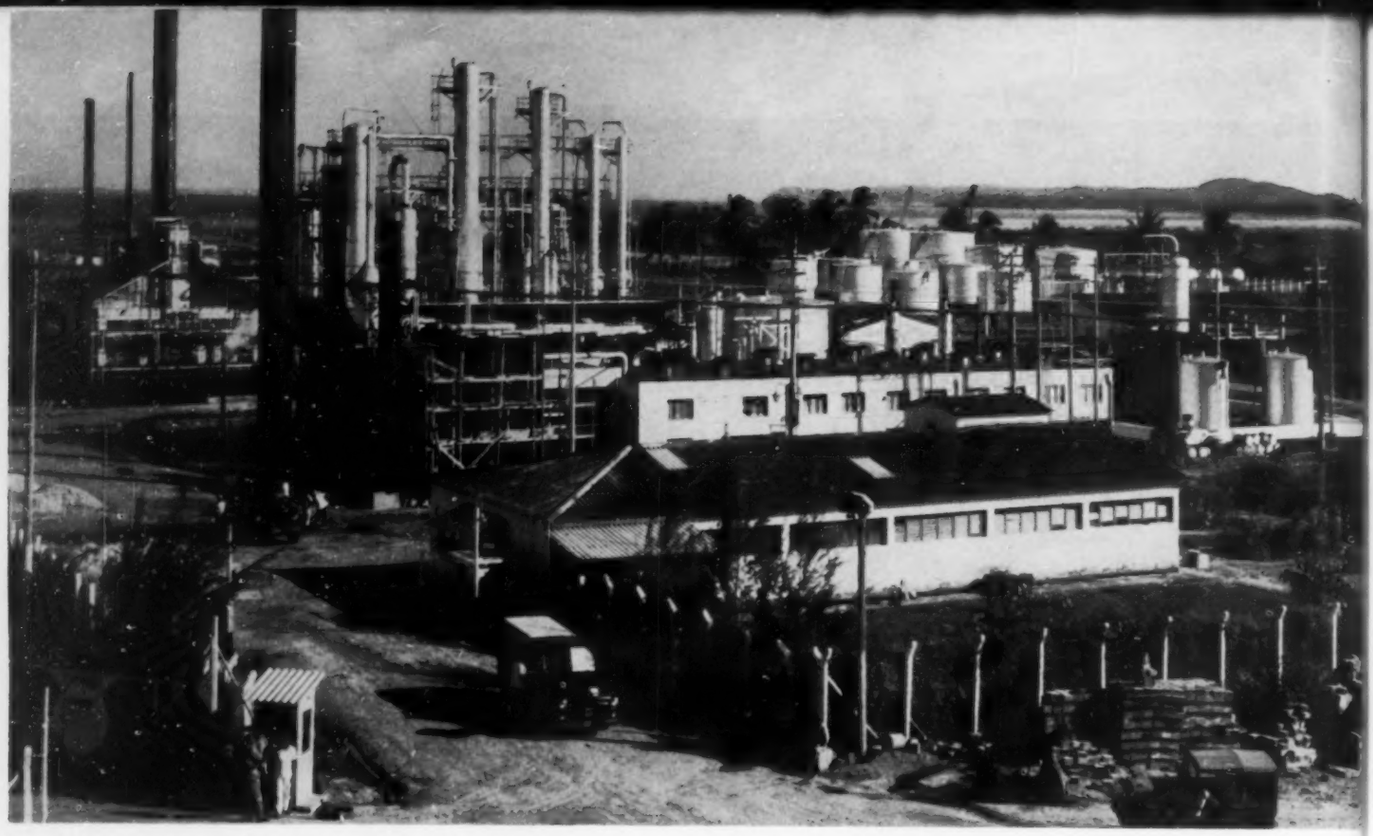


Part of the process area at the 35,000 b/d Landulfo Alves refinery of Petrobras in Mataripe, Bahia State

Brazil's oil hunt

by R. G. Walker

Exploration activity is being concentrated in five areas. Proved producing areas have been extended. Crude production has reached 85,000 b/d, and recoverable reserves are now estimated at about 617 million barrels

EXPLORATION RESEARCH has now penetrated Brazil's ten sedimentary basins covering 1,351,000 square miles, or 41% of the national territory. During 1960 activity was concentrated at five points: (1) on the Middle Amazon River; (2) in the San Francisco Estuary, where two wells are producing oil in small, but commercial, quantities between Alagoas and Sergipe; (3) in Sao Paulo in the Paranapanema Valley, near Itapetininga; (4) in Santa Catarina, in the Cacador area; and (5) in Mato Grosso in the municipality of Dourados. In these two last-named States, oil has been found in non-commercial quantities in recent exploratory wells.

Drilling has been definitely abandoned in the Nova Olinda area on the Madeira River, where oil was first found outside Bahia in 1954. Wells 1 and 2 gave out after producing 300 and 1,400 bbls, respectively, and four others proved dry at around 9,000 ft.

Activity was subsequently transferred to the Middle Amazon, to Autas Mirim on Careiro Island, and oil was discovered in the Monte Alegre formation for the first time in December 1959 at 3,578 ft. in well AM-6, although only in small quantities. The prospects of finding commercial oil in the neighborhood are considered good, however, and drilling continues, the tenth wildcat having reached 4,267 ft. by the end of August, 1960.

Seven other wildcats and six strats were then drilling in the States of Amazonas and Para. The Regional Superintendency of Amazonia has jurisdiction over those States and Maranham, as well as over the Federal Territories of Acre, Rondonia, Rio Branco and Amapa. It employs 4,500 men and its exploration section operates from the coast of Maranham to the frontiers of Colombia, Peru, and Venezuela. Petrobras will have spent 2,500 million cruzeiros on exploration in Amazonia this year, as compared with 2,000 million in 1959.

In all, 62 rigs are now operating in the various sedimentary areas, as against 56 at the same date in 1959, and 69 teams are at work, including nine surface geological, 36 exploratory, 10 gravimetric and 14 seismographic. The average monthly cost of a geological team in Bahia this year is 423,000 cruzeiros, that of a seismographic team is 4,300,000 cruzeiros. In the future, owing to the high cost of rigs, Petrobras will lease any additions required, instead of purchasing. The tendency is also to maintain more drilling contracts with private firms, foreign or Brazilian; but whereas the contractor formerly supplied specialized labor only, he now supplies all materials also.

During the first four months of 1960, the latest date for which full details are available, Petrobras completed 75 wells, of which 48 were oil producers, the footage drilled totalling 349,463 ft. Comparative figures for the same period of 1959 were 68 wells, 36 oil producers and 248,383 ft. By August 31 of this year 56 wells had been spudded, including 23 exploratory wells. In addition

TABLE 1—Brazil Drilling Review (1939 to 1960)

Year	Wells Drilled	Oil Producers	Gas	Dry	Injection
1939-1957	647	377	40	229	—
1958	111	72	—	26	14
1959	227	127	—	100	—
Jan.-April 1960	75	48	—	26	1
	1,060	624	40	381	15

to Amazonas and Para, rigs were operating in the States of Maranham, Alagoas, Sergipe, Bahia, Parana, Sao Paulo, Santa Catarina, Rio Grande do Sul and Mato Grosso. Drilling in Espirito Santo and in the Campos area of the State of Rio de Janeiro was suspended as no oil shows were found.

All commercial oil producers discovered during the first four months of 1960 are located in Bahia. One Amazon well, Nova Olinda 1, discovered in 1954, is officially recorded as an oil producer, although non-commercial, and three Alagoas wells—two spudded in 1957 and one in 1959—are also registered as oil producers.

The proved producing areas of the Candeias, Agua Grande and D. Joao fields in the Bahia Reconcavo were extended this year. In the Buracica, Taquipe and Cassarongongo fields, discovered late in 1959, 39 wells started production after March, on completion of the 32-mile pipeline connecting them to the Candeias system and the Madre de Deus ocean terminal. The latter is being enlarged, the pier being lengthened to 2,440 ft to accommodate two tankers at the same time, and four additional tanks, each of 150,000 bbl capacity, are being installed.

The following new oil fields had been discovered by mid-September of this year: (1) at Sauipe in the Bahia municipality of Alagoinhas, 12 miles northeast of the Buracica field and outside the Reconcavo (the first wildcat in the new field, SE-1, produced 700 bbl on test and more wells are planned in the neighborhood); (2) at Jacaranda, in Bahia, ¼ mile south of Sao Sebastiao, where oil and gas shows were found at 3,659 ft; and (3) north of Sauipe, at Ouricanguinhas, oil has been found, apparently in commercial quantities.

Exploration is now starting in the Tucano Valley, Bahia, and in Sao Paulo three miles from Aracutuba.

Russian technicians, under contract to Petrobras, are investigating the possibilities of building a plant similar to that at Leningrad to replace the existing pilot plant at Taubate and process the bituminous schist of the Paraiba Valley.

TABLE 2—Wells Drilled per Federal Unit, 1939-1960

Unit	1939-57	1958	1959	Jan.-April 1960	Totals
Acre	2	—	—	—	2
Amazonas	6	17	24	5	52
Para	7	2	11	—	20
Maranham	8	5	4	1	18
Rio Grande do Norte	2	—	—	—	2
Alagoas	10	8	14	4	36
Sergipe	4	1	2	2	9
Bahia	574	101	162	59	896
Espirito Santo	—	—	1	1	2
Rio	—	—	1	—	1
Sao Paulo	1	2	2	1	6
Parana	5	3	2	—	10
Santa Catarina	—	1	1	—	2
Rio Grande do Sul	—	—	1	2	3
Mato Grosso	—	—	1	—	1

Oil from 25 offshore producing wells flows continuously and under automatic control through this collecting station in All Saints Bay near Salvador. Petrobras photo.

Brazil's crude production, which rose progressively from 2,719 b/d in 1954 to 64,630 b/d in 1959, had reached 85,000 in August this year. The target fixed for 1960 has accordingly been raised from 60,000 to 100,000 b/d, which corresponds to 45% of Brazil's present requirements. Average production per Bahia well increased from 265.9 b/d in 1959 to 428.4 in the first four months of 1960. The Agua Grande field produced an average of 47,481 b/d in March, followed by the Candeias field with 15,228.

The latest estimate places Bahia's recoverable reserves at 617 million bbl, excluding the newly discovered fields of Sauipe, Sao Sebastiao and Ouricanguinhas, not yet calculated. The fields now known and in process of expansion indicate that crude production can safely be raised to 110,000 b/d in 1961.

Until Brazil's refineries are equipped to process Bahia crude with its high paraffin content, national production supplies only about 37% of their requirements, Petrobras making up the deficiency by importing. In 1959, 22,570,605 bbl were acquired abroad at a cost of US $64,253,605.29 cif Brazil. The average landed price per bbl dropped from US $3.01816 in 1958 to US $2.8467 in 1959.

The value of Bahia crude processed in Brazil and exported in 1959 amounted to US $36,378,000 and US $31,136,000, respectively. Bahia crude is exported under

The PRESIDENTE FLORIANO, a 34,550-dwt vessel, is one of the latest supertankers to be added to the Petrobras fleet

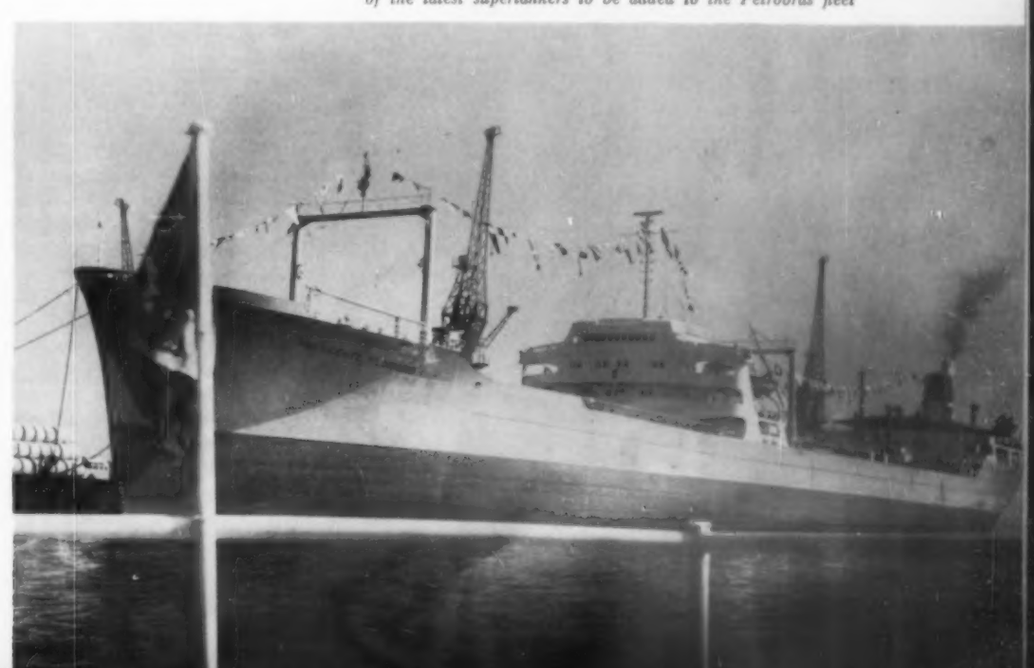


TABLE 3—The Saving in Dollar Equivalents on Petroleum Imports Due to the National Petroleum Industry Since 1955 (U. S. $1,000)

Period	Total	Crude	Refining: Petrobras	Refining: Private	Refining: Subtotal	Sea Transport
1955	32,518	5,601	13,101	12,950	26,051	866
1956	71,089	11,283	36,701	19,360	56,061	3,745
1957	103,288	30,510	40,578	26,862	67,440	5,338
1958	124,883	59,273	38,811	20,168	58,979	6,631
1959	143,544	67,493	45,832	25,411	71,243	4,808
Jan.-Mar. 1960	37,966	19,520	10,009	6,314	16,323	2,123

TABLE 4—Crude Runs and Production of Refined Products, 1955-59, in Barrels Daily

Year	Crude Processed	Gasoline	Solvents	Fuel Oil	Diesel	LPGas	Asphalt	Aromatic Residues	Others
1955	70,465	30,791	525	28,294	5,898	1,490	266	—	—
1956	108,224	49,656	1,051	42,654	7,902	3,675	935	—	—
1957	123,439	49,304	1,389	47,211	13,018	5,246	1,372	28	—
1958	135,098	49,321	2,030	51,088	16,706	5,617	2,514	570	54
1959	149,869	52,524	2,050	58,101	18,100	6,578	3,540	1,115	269

an agreement with Esso Standard Oil, according to which the latter acquires 30 million bbl for three years, or until the national refineries are equipped to process it.

Petrobras estimates Brazilian oil consumption for 1960 at 250,000 b/d. The breakdown in barrels per day is: aviation gasoline, 8,700; motor gasoline, 74,000; kerosine, 11,500; LPGas, 11,500; diesel fuel, 58,000; fuel oil, 82,500; lubricants, 3,800.

Within the next few months, national refineries are expected to process 218,000 b/d and to become self-sufficient as regards refined products in 1961; private plants process 58,800 b/d. The state-owned Presidente Bernardes Refinery is raising capacity from 100,000 to 110,000 b/d and the Landulfo Alves (Mataripe) refinery is increasing from 35,000 to 52,000. The 90,000 b/d refinery at Duque de Caxias (Rio) is scheduled to start production at 60,000 b/d early in 1961, while Petrobras plans to begin building the Minas Gerais refinery, near Belo Horizonte, within the next few months and the Rio Grande do Sul plant at Porto Alegre possibly in 1961.

The initial capacity of the Belo Horizonte plant will be 25,000 b/d, rising later to 45,000. Eleven international companies have submitted tenders for the 298-mile, 12-in. crude pipeline to connect the refinery to Rio de Janeiro at an estimated cost of 2,200 million cruzeiros.

A pier and pipeline, 11 miles long, is under construction at Agua Island, in the Guanabara Bay at Rio de Janeiro, to supply crude to the Duque de Caxias refinery and distribute the latter's refined products. The pipe will have two 26-in. lines for crude and two of 14-in. for derivatives; capacity 20,000 bbl/hr. The pier will accommodate two tankers working simultaneously.

Aerial view of AM-3-AZ, a well in the Autaz-Mirins region of Amazonas, where frequent flooding requires boat transportation

The areas served by the existing private and state refineries and the estimated needs of each area are as follows:

Manaus refinery (6,500 b/d) supplies North Brazil from Acre Territory to the State of Piaui; estimated consumer needs 6,000 b/d.

Landulfo Alves refinery, Mataripe, (35,000 b/d), supplies all States from Ceara to Espirito Santo, consumption 30,000 b/d.

Presidente Bernardes, Cubatao, near Santos (105,000 b/d); Petroleo Uniao, Sao Paulo, private plant (31,000 b/d); Industrias Matarazzo, Sao Paulo, private plant (5,000 b/d); these supply the States of Sao Paulo, Parana, Santa Catarina, Mato Grosso, Rio Grande do Sul and part of Minas Gerais, consumption 125,000 b/d.

Distilaria Rio Grandense, Rio Grande do Sul (300 b/d) and Ipiranga S.A. Rio Grande, Rio Grande do Sul (6,000 b/d); both private plants, supply part of Rio Grande do Sul consumer needs, 25,000 b/d.

The asphalt factory, annexed to the Cubatao refinery, processes 3,840 b/sd of Boscan crude; estimated output: solid asphalt 145,000 ton/yr, and liquid 27,000 ton/yr; output of fertilizer plant, 48,000 ton/yr.

Petrobras refineries also produce some 320,000 tons of turpentine annually.

Petrobras has agreed with the Soviet Union to import 100,000 tons of diesel oil and 600,000 tons of crude, with the option to reduce the latter amount to 400,000 and make up the difference with diesel oil. The total import will cost US $10 million.

Yacimientos Petroliferos Fiscales aims to export its surplus crude production and primary refined products from Argentina to Brazil, commencing in the second half of 1961, and is appointing an agent in Rio on one percent commission to handle sales.

Petrobras is also negotiating with Petroleos Mexicanos to exchange Brazilian iron with Mexican crude and residual products. Petrobras said Brazil produces 85,000 b/d of crude and requires twice that amount.

As part of the plan to develop a Latin American Common Market, a Mixed Commission is being created to arrange for cooperation between the chiefs of government oil enterprises in Mexico, Argentina, Brazil, Bolivia, Peru and Venezuela. The treaty setting up a Free Trade Zone, as signed in Montevideo in February 1960, excluded operations of purchase and sale of crude petroleum and derivatives pending further investigation.

In the field of transportation, Petrobras took delivery of four new tankers of 33,000 to 35,000 dwt during the first eight months of 1960 and one 10,000 tonner, the first of six ordered in Denmark. This brings the total capacity of the fleet up to 510,000 tons. Despite the considerable expansion of the past three years, the fleet is not yet able to cope with Brazil's import needs, and ships of other flags are often freighted.

In 1959 the Petrobras long-distance tankers carried 1,872,636 tons of crude and 1,457,148 tons of refined products, while the coastwise tankers carried 1,290,156 tons of crude and 1,586,184 tons of derivatives.

The Santos-Sao Paulo pipeline carried 11,025 million litres of crude and refined products in 1959.

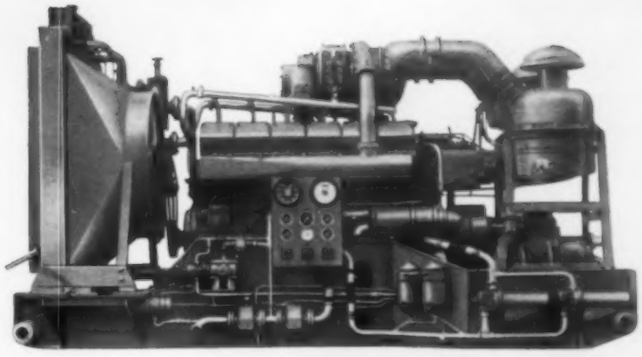
Petrobras reports that expansion of the domestic market for petroleum derivaties steadied at 4% between 1958 and 1959 and will probably continue to expand at about that rate unless unexpected circumstances arise. The progress of industrial development tends to stabilize, the post-war shortage of hydro-electric power is gradually being eliminated, and large-scale imports of motor vehicles with high gasoline consumption per mile are giving place to national production of units of low consumption. On the other hand, diesel traction is rapidly replacing steam on Brazil's railways, the use of automobiles and trucks is increasing, an ambitious program of road-building is under way and industrial development is expanding at a healthy rate, if slightly lower than in the late 50's. END

TABLE 5—The Value in Dollar Equivalents of Imports of Petroleum and Derivatives in 1958 and 1959

(Value in US $1,000)

Import	1958	1959
LPGas	5,934	7,681
Aviation gasoline	19,524	19,119
Motor gasoline	26,945	16,287
Solvents	121	152
Kerosine	11,210	8,400
Diesel oil	37,519	42,566
Fuel oil	34,342	22,541
Lubricants	12,497	14,418
Sub-total	148,092	131,164
Crude petroleum	133,265	122,682
Total	281,357	253,846

A range of engines for all requirements



079 MA•

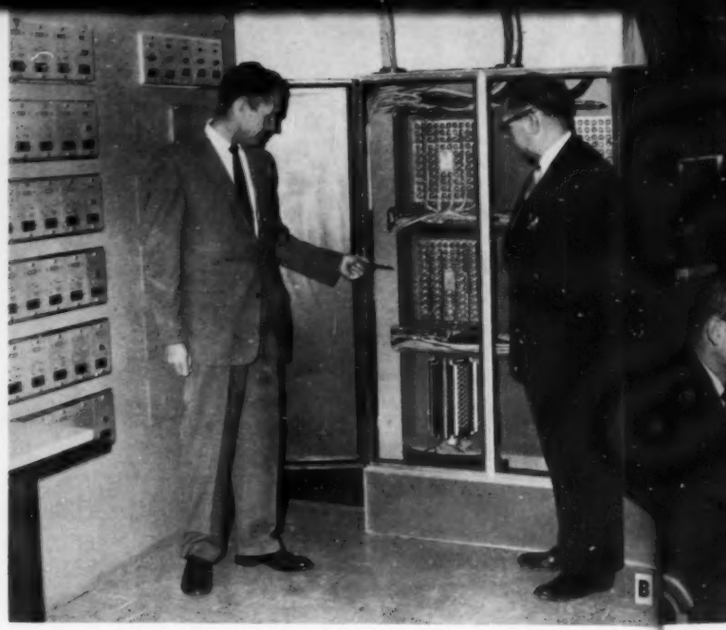
Mercedes-Benz Diesel engines, in common with all the products of Daimler-Benz, are world-famed for their high performance, economy, robust construction and dependability. They have further advantages which are of particular importance for drilling operations. They have a large overload reserve, they are completely equipped for work on drill sites and they comply with the international safety regulations. 34 different Mercedes-Benz Diesel engines ranging from 20 to over thousand PS are available. This wide range includes the right engines to meet the specific requirements for drilling operations.

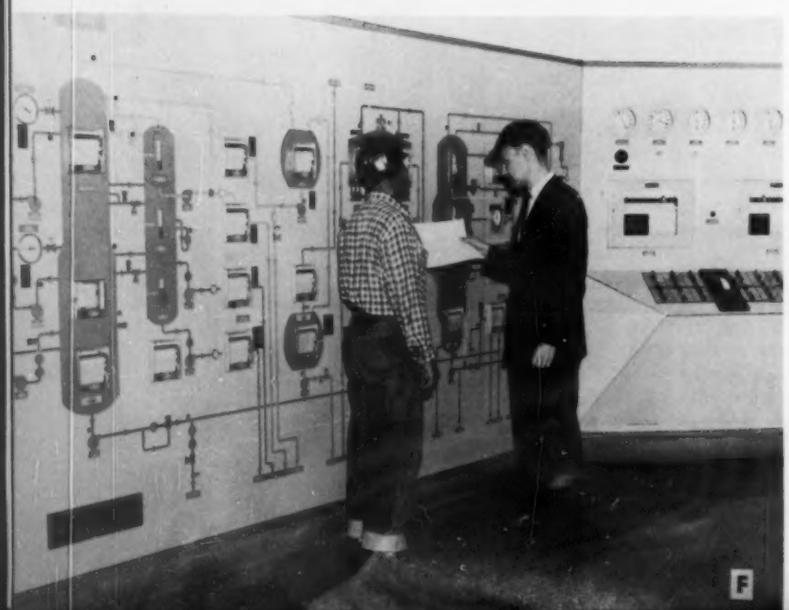
Types and Performance Data Type	Cooling	No. of cylinders Arrangement	Output PS (DIN)	Speedrange R.P.M.	Cyl. Bore ins.	Stroke ins.	Piston displacement cu. ins.	Weight approx. lbs.
M 202 B	W	2/S	35 – 55	750 – 1200	5 1/2	8 1/4	394.8	1665
M 203 B	W	3/S	54 – 90	750 – 1200	5 1/2	8 1/4	591.9	2150
M 204 B	W	4/S	72 – 120	750 – 1200	5 1/2	8 1/4	789.0	2715
OM 636	W	4/S	17 – 35	1500 – 3000	2 15/16	3 15/16	107.8	495
OM 312	W	6/S	47 – 77	1500 – 2400	3 9/16	4 3/4	279.5	784
OM 321	W	6/S	55 – 94	1500 – 2600	3 9/16	4 3/4	311.2	784
OM 315	W	6/S	80 – 124	1200 – 1800	4 7/16	5 1/2	505.0	1700
OM 326	W	6/S	97 – 155	1200 – 1800	5 3/64	5 1/2	660.0	1720
MB 851	W	1/S	9 – 20	1000 – 2000	4 1/2	5 1/2	88.8	662
MB 861	L	1/S	9 – 20	1000 – 2000	4 1/2	5 1/2	88.8	662
MB 852	W	2/S	18 – 40	1000 – 2000	4 1/2	5 1/2	176.9	915
MB 862	L	2/S	18 – 40	1000 – 2000	4 1/2	5 1/2	176.9	915
MB 853	W	3/S	27 – 60	1000 – 2000	4 1/2	5 1/2	266	1122
MB 863	L	3/S	27 – 60	1000 – 2000	4 1/2	5 1/2	266	1122
MB 854	W	4/V	36 – 80	1000 – 2000	4 1/2	5 1/2	354.4	1245
MB 864	L	4/V	36 – 80	1000 – 2000	4 1/2	5 1/2	354.4	1245
MB 846 A	W	6/S	114 – 250	750 – 1500	5 7/8	7 1/2	1230.2	3860
MB 846 B	W	6/Li	114 – 250	750 – 1500	5 7/8	7 1/2	1230.2	3970
MB 846 Ab ▽	W	6/S	148 – 320	750 – 1500	5 7/8	7 1/2	1230.2	4080
MB 846 Ad ▼	W	6/S	148 – 320	750 – 1500	5 7/8	7 1/2	1230.2	4200
MB 846 Bb ▽	W	6/Li	148 – 320	750 – 1500	5 7/8	7 1/2	1230.2	4200
MB 836 B	W	6/S	240 – 375	1000 – 1500	6 7/8	8 1/16	1806.3	4380
MB 836 Bb ▽	W	6/S	320 – 525	1000 – 1500	6 7/8	8 1/16	1806.3	4830
MB 836 Db ▼	W	6/S	370 – 650	1000 – 1500	6 7/8	8 1/16	1806.3	5050
MB 820 B	W	12/V	460 – 750	1000 – 1500	6 7/8	8 1/16	3612.6	6180
MB 820 Bb ▽	W	12/V	640 – 1100	1000 – 1500	6 7/8	8 1/16	3612.6	6900
MB 820 Db ▼	W	12/V	770 – 1350	1000 – 1500	6 7/8	8 1/16	3612.6	7240
MB 837 A	W	8/V	165 – 440	1000 – 2000	6 1/2	6 7/8	1825	2940
MB 837 Aa ▽ ▽	W	8/V	215 – 550	1000 – 2000	6 1/2	6 7/8	1825	3020
MB 835 Ab ▽	W	12/V	840 – 1450	1000 – 1500	7 1/2	9 1/2	4773	8157
MB 835 Bb ▼	W	12/V	1015 – 1780	1000 – 1500	7 1/2	9 1/2	4773	8597
MB 839 Ab ▽	W	16/V	1120 – 2000	1000 – 1500	7 1/2	9 1/16	6380	11020
MB 839 Bb ▼	W	16/V	1350 – 2400	1000 – 1500	7 1/2	9 1/16	6380	11450
MB 518 B ▼ ▼	W	20/V	3000	1720	7 5/16	9 3/16	8201.5	10550

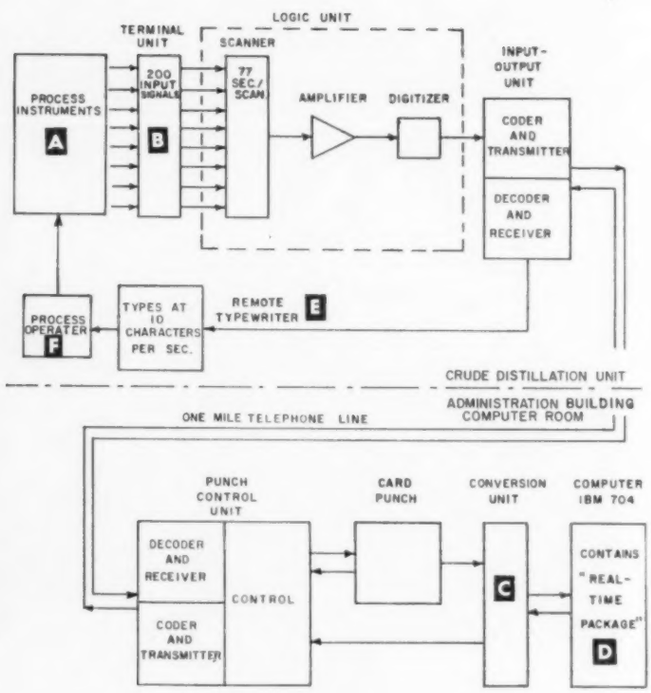
Note:

W = water cooling · L = air cooling
Li = horizontal · S = vertical
V = vee type · ▽ = with exhaust-turbo-supercharging · ▼ = with exhaust-turbo-supercharging and boost intercooling · ▽ ▽ = with mechanical supercharging
▼ ▼ = with mechanical supercharging and boost intercooling

MERCEDES-BENZ DIESEL



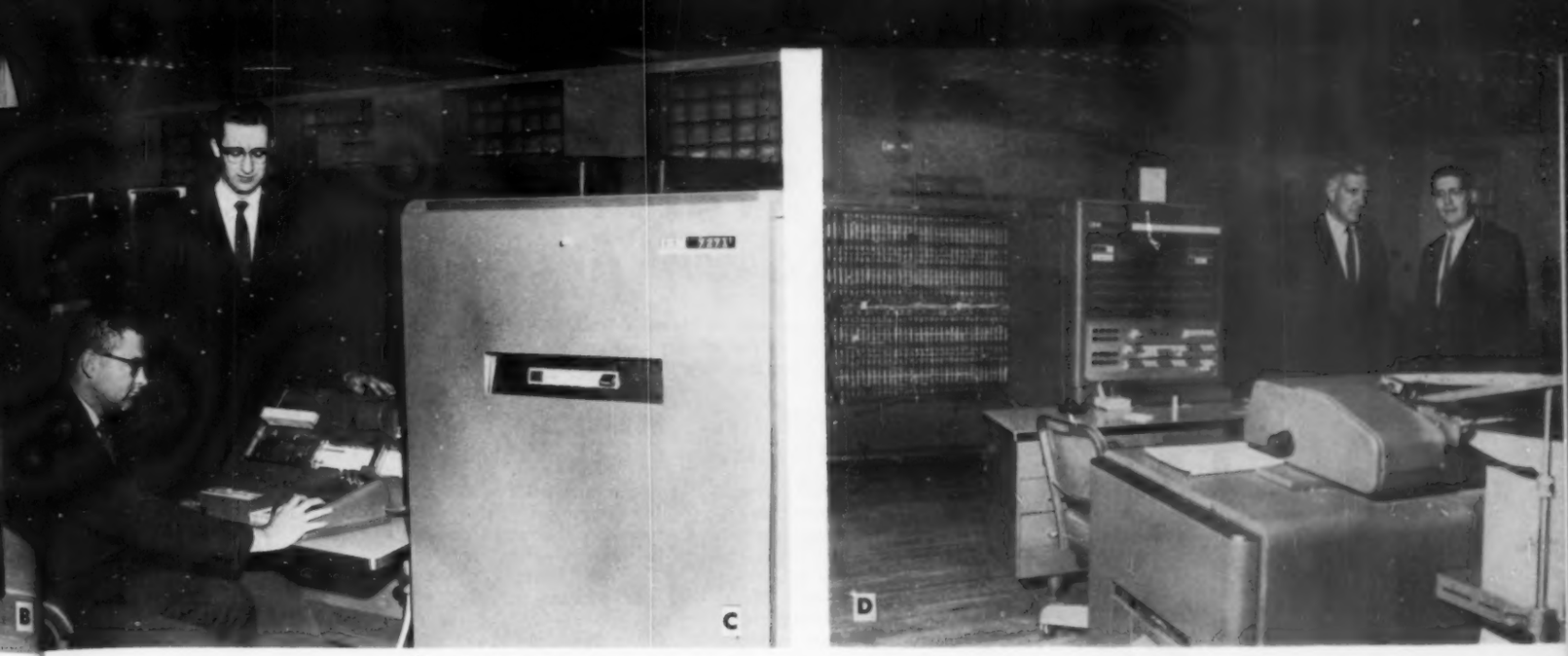




HOW THE INDIANA STANDARD COMPUTER WORKS, as shown in the above schematic drawing of the system tied in with a series of six photographs.

Signals from the process units on the 140,000 b/d crude still (A), go to the terminal unit (B), where transducers convert them from pneumatic to electrical, and transmit them via a one-mile telephone line to a receiver and conversion unit (C), which prepares them for entry into the computer proper.

Following built-in instructions, the computer (D) prints out its results on a printer and sends back "orders" to the remote typewriter (E) at the control room. Typed orders are then delivered to the operator (F) who makes the necessary adjustments at the control panel to keep the unit operating at peak process efficiency.



Electronic computer monitors world's largest crude still

Receiving signals from 196 instruments on Indiana Standard's 140,000 b/d unit every four minutes, huge computer then automatically types out instructions every 20 minutes telling how the distillation unit should be operated so as to maintain its efficiency

AN ELECTRONIC COMPUTER is now telling one of the world's largest refining units how to operate at peak efficiency—the 140,000 b/d crude distillation unit at the Whiting, Ind., refinery of Standard Oil Co. (Indiana).

Every four minutes, an IBM 704 computer reads 196 instruments; every 20 minutes it types out orders that originate from about 75,000 stored instructions. This is the first time a computer system has so completely controlled any industrial operation as complex as the giant Indiana Standard crude still, according to Standard's President John E. Swearingen and Gilbert E. Jones, president of International Business Machine Corp.'s data processing division.

Signals from the 196 instruments are transmitted over a telephone line to the IBM 704, which is housed in Standard Oil's technical center about a mile away. Computations sent back to the control room of the crude still, and automatically printed on an IBM typewriter, guide the operators in adjusting as many as 19 controls as needed to maintain top operating efficiency.

Such close guidance was impossible before the computer program was developed. Calculating similar data manually would give the needed information too late to be useful, Messrs. Swearingen and Jones emphasized. Furthermore, they said, the computer handles the complex task with time to spare for work on other scientific assignments.

Representatives of both companies described the developments to date as open-loop or semi-automatic control, in which controls are set manually. Full closed-loop control a simple next step, will be taken early next year. Computer output will then adjust control settings automatically.

Mr. Swearingen said that crude-oil distillation is an ideal first choice for computer control because it is basic to all refinery operations. Control techniques developed in this project will have wide future applications for the company.

"It is significant also," Mr. Swearingen pointed out, "that this unit employs new methods of instrumentation developed by Standard Oil which make it easier and far more practical for us to employ computer control. Specialized instruments still are under development in our laboratories, and one new instrument is being tested on the unit now that is expected to lead to further improvement of the operation.

"Plans are already developed for a computer installation on an Ultraforming unit, and catalytic cracking and alkylation are other likely prospects currently under study for control of computers."

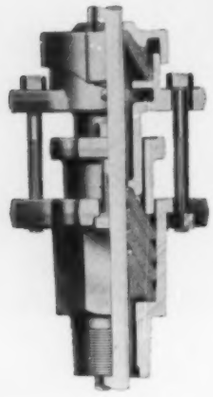
Standard Oil expects a satisfactory economic return from computer control to the crude unit because of its huge throughput. But Mr. Swearingen pointed out that the company is looking more toward the long-range impact of this development on refinery operations broadly.

"We are determined to make our operations more efficient," he said. "Every new

HERCULES CONE PACKED STUFFING BOXES

Provide the ultimate in SAFETY, ECONOMY and EASE of operation

Hercules Stuffing Boxes — like all Hercules Products — are improved constantly to meet the changing needs of the industry and are available in three styles. They are used internationally and are available through supply houses, everywhere.

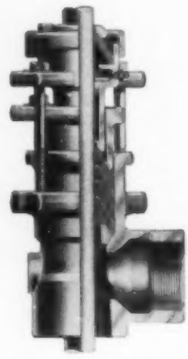


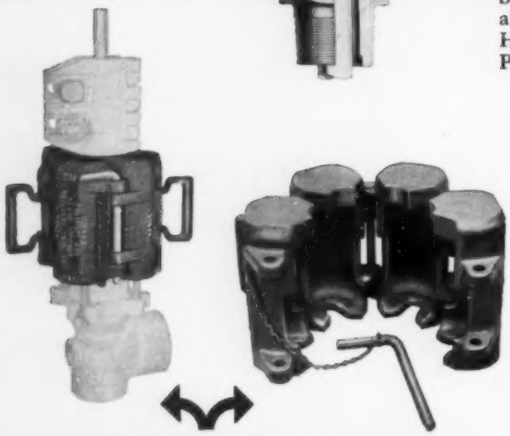
HERCULES REGULAR TYPE DUPLEX STUFFING BOX

More efficient operation with fine adjustment possible. Offers longer packing life due to ability of Packing and Glands to follow lateral movement of Polished Rod. Malleable iron construction prevents breakage if rods are accidentally dropped on Stuffing Box. Has male thread to screw into Pumping Tee.

HERCULES TEE TYPE DUPLEX STUFFING BOX

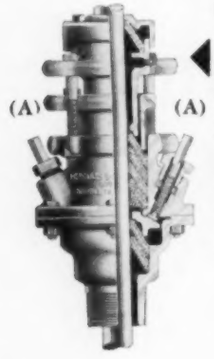
A combination Tee and Stuffing Box only 15" high. Eliminates one threaded connection between Stuffing Box and Tee. Full opening — allows rods to be run or pulled without removing Stuffing Box body. Has female thread to screw directly onto tubing.





HERCULES POLISHED ROD CLAMP-OFF SUPPORT

Used with Hercules Regular and Tee Type Stuffing Boxes to *prevent accidents* or personal injuries while clamping off. Manufactured from high tensile aluminum alloy, will safely support 30,000 lbs. weight.

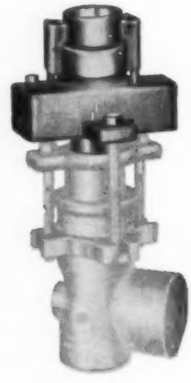


HERCULES TYPE DP (Double Packed)

Duplex Stuffing Box for use on high pressure or intermittently flowing wells. Allows Main (upper) Packing to be safely and easily replaced while well is under pressure. The two compression bolts (A) are turned clockwise until the lower Packing seals off. The Main Packing can then be removed and replaced.

HERCULES OIL RESERVOIR GLAND

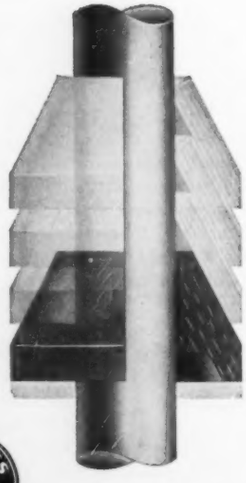
All Hercules Stuffing Boxes may be equipped with *Oil Reservoir Upper Gland* on *problem* wells which pump off and burn packing. The polished rod runs through the Reservoir, and is cooled and lubricated by its fluid.



For Best Results in Hercules Stuffing Boxes, use only

HERCULES CONE-SHAPED PACKING RINGS

Each set of Hercules Cone-Shaped Packing Rings now include the NEW, SOLID Split Bottom Cone Packing Ring. This new solid ring provides greater contact with the polished rod and a more substantial base for the upper Packing Rings, resulting in *longer* packing life and superior performance. A complete set now consists of three *regular* and one new split *Bottom Cone* Ring.



THERE'S A TYPE SPLIT CONE PACKING RING FOR EVERY REQUIREMENT:

Hercules Split Cone Packing Rings come in four grades: SOFT, HARD, SPECIAL LUBRICATED and HEAVY DUTY. SOFT Rings are always used with bronze liners or with steel polished rods in wells which are not always pumping fluid. HARD Rings are recommended for steel polished rods only, and where fluid is constantly being pumped. SPECIAL LUBRICATED Rings are recommended for problem wells which pump off persistently. When well is pumped dry, the rings lubricate the polished rod and prevent the packing from burning until fluid is again present. HEAVY DUTY Rings are recommended for problem wells. Properly adjusted, they give phenomenal life.

ACCEPT NO SUBSTITUTES

Ask for and accept only Hercules Cone-Shaped Packing Rings for use in all HERCULES Duplex Stuffing Boxes. All HERCULES Products are available through Your Supply Store.

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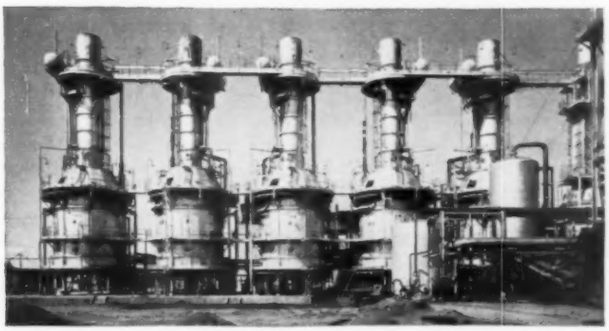
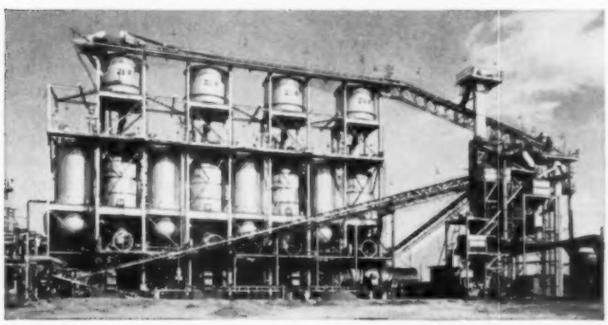
STEEL WITHOUT COAL



Above: Kellogg-designed Steam Reforming Furnaces. Below: Iron Ore Reactors.



Below: Hojalata y Lamina steel works; Direct Reduction Plant outlined in white.

Success of HyL Direct Reduction Process in Mexico Broadens Markets for Natural Gas

Now in operation at Monterrey, Mexico, the 500 ton/day plant shown in two views at left was designed by The M. W. Kellogg Company—who also provided procurement, plant construction, and start-up services for Hojalata y Lamina, S.A. This plant is based upon the HyL Direct Reduction Process—an original development of Hojalata y Lamina, and uses reformed natural gas to produce high quality melting stock directly from iron ore.

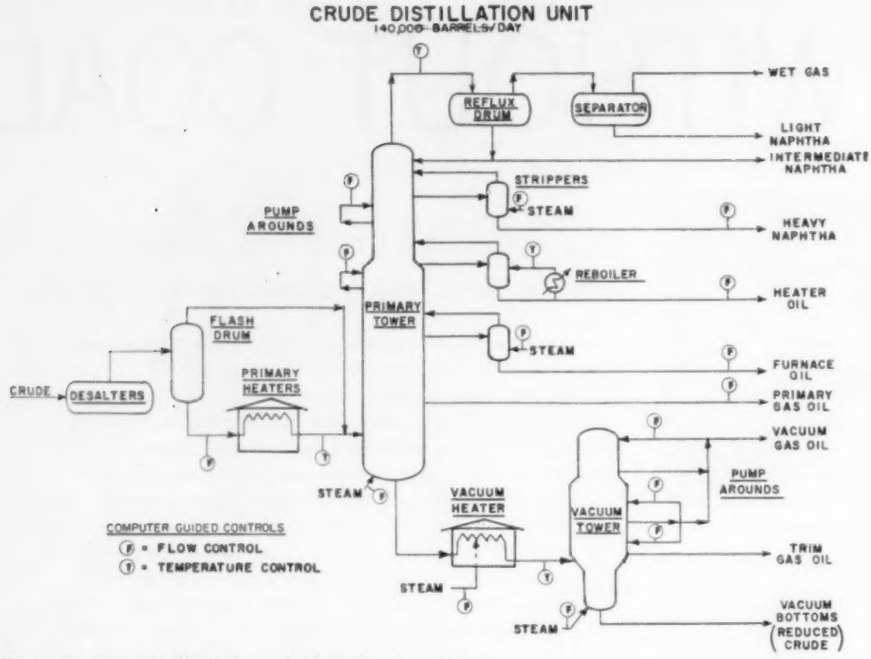
Largest direct reduction plant in the world, the Monterrey project supplies melting stock for the electric furnaces of Hojalata y Lamina's adjacent 300,000 ton/year steel works. Completion of this plant makes the Mexican firm the first modern integrated steel company to base its operations on direct reduction, independent of imported scrap.

For more information about this new and promising use for natural gas throughout the world, ask for Kellogg's 12-page brochure, "Steelmaking by the HyL Direct Reduction Process." Also inquire about Kellogg's 17-minute color-sound film on Monterrey.

THE M. W. KELLOGG COMPANY

711 Third Ave., New York 17. *A subsidiary of Pullman Incorporated*

Offices of other Kellogg companies are in Rio de Janeiro, Caracas, Buenos Aires, Toronto, London, Paris



Flow chart of crude distillation unit shows location of the process controls which are guided by the electronic computer.

piece of knowledge we gain about our processes and the capabilities of computing systems for controlling them will help us reach this goal more rapidly."

According to Mr. Jones, "Standard of Indiana process engineers and IBM's systems engineers have translated the most complex phase of refinery operations into a working mathematical model. A 140,000 b/d crude oil distillation unit is now under the control of a large scale, time shared, general-purpose computer. This achievement is enormously more complex than anything previously done in the process field and clearly foreshadows the rapid exploitation of computer-based industrial control. The near future should see a broad spectrum of machines (both general purpose and special purpose) monitoring and controlling processes to the degree required by the users."

Dr. R. B. Jacobs, director of engineering research, is responsible for this development for Standard Oil under S. A. Montgomery, vice president of manufacturing, and Dr. P. C. White, general manager of research and development. H. M. Hart is the project director actively in charge of the development for Standard Oil, and R. T. O'Neil is the project coordinator.

Dr. C. C. Hurd, project manager of the IBM advanced systems development division, is the head of the IBM process control department. A. D. Pendleton is coordinator for the IBM group at Whiting and Dr. D. R. Kuehn is in charge of development and implementation of control optimization for the program.

Early Work on Crude Distillation. Chemical and control engineers from Indiana Standard and IBM have been engaged in joint development of process control since July, 1958. Preliminary studies were conducted by the joint research team on a 60,000 b/d crude oil pipe still at Whiting. Some 100 temperature, pressure and flow readings were telephoned to the computer center and punched into cards. After editing for completeness, the information was processed on an IBM 650. This involved collecting data on material and heat balances and tray-by-tray vapor and liquid loadings every four hours. The computer provided technical specialists with accurate yields of products, heat loads on furnaces and tray-by-tray vapor and liquid loadings.

Accuracy of the computations was enhanced by adjusting measurements to satisfy several heat and material balances around overlapping circuits, including the primary and vacuum towers, crude preheat exchanger train and the two primary tower pumparound systems.

This called for statistical routines. Simultaneous solution by least squares technique was used to achieve the best possible balance. Factors were also introduced which weighed individual meter reliability based on whether calibration against tankage had been possible and on current pen position on a square-root chart.

The output information guided engineers in their search for more knowledge about the process. By comparing current results and recent trends against the constraints of the unit, they could apply judgment and determine how control settings should be changed.

Investigators learned that operators would not have made adjustments to transfer line temperatures, crude oil rate or primary tower pressure without the computed diagnosis. But still other control opportunities were clearly missed.

One reason for this was the reluctance to decide on changes based on a single indication and the relatively long time interval between two successive diagnoses. Another shortcoming was that manually collected data was not entirely free from errors.

Present Application in Crude Distillation. As tests on the smaller still were in progress, Standard Oil began operating its 140,000 b/d crude unit at Whiting in May, 1959. Some 90,000 b/d are removed as overhead and sidestream products in the primary tower; these are wet gas, three naphtha streams, two distillate fuels and light gas oil. The remaining 50,000 b/d of the crude charge is fed to the vacuum tower whose products are heavy gas oil and reduced crude.

When it began operation, the new still featured more instrumentation techniques. Operators were able to maintain normally stable operation and made highly acceptable products at reasonable throughputs. However, there was no assurance that the plant was running at highest yield of the more valuable petroleum products or with most efficient use of fuel. Additionally, conventional instruments could control only one variable according to some relatively simple objective. For example, a temperature could be controlled at a constant value or a flow regulated at a constant ratio to another flow.

The results of the computer-control trials at the smaller crude unit pointed the way to the solution of those problems and it was decided to continue the development on a fully automated basis on the largest unit where payoffs would be greatest.

Operating Variables of Several Types were considered pertinent to control. These include primary, constrained and economic variables.

Primary, or independent variables, can either be controlled or uncontrolled. Those which can be controlled are manipulated by plant operators. While there are nearly 100 of these, only 19 were considered important for hour-to-hour control of the unit.

The uncontrolled variables, which operators could not manipulate, included several aspects of crude quality and ambient conditions. Their fluctuation justifies, to a large extent, computer control.

Constrained variables limit the mode of operation of the process beyond the obvious limits of the 19 controllers. They can be either equipment constraints—reflecting the unit's physical limitations—or production constraints which are management-imposed targets set at short intervals. The latter may be expressed in terms of crude-oil feed rates or quantity or quality of material to be produced. Altogether there are about 160 constrained variables of which 54 are important to control.

Economic variables are important to optimization and include such things as incremental prices and costs, actual product quantities and consumption of raw materials and utilities.

(Continued on page 75)

IN ENGLAND

Dewrance & Co. Ltd., London
Ashcroft Duragauges
Ashcroft Pneumatic Transmitters
Consolidated Safety Relief Valves
Consolidated Safety Valves
Consolidated "Maxiflow" Safety Valves
Consolidated "Electromatic" Relief Valves

IN FRANCE

Sapag, Paris
Consolidated Safety Relief Valves
Hancock Steel Gate and Globe Valves
Hancock Steel "Flocontrol" Valves

Ready to serve you anywhere on the globe

IN CANADA

Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario
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Consolidated Safety and Safety Relief Valves
Hancock Bronze and Steel Valves
American Bi-Metal Thermometers
American Temperature Regulators

IN BELGIUM

Ateliers Jaspor, S.A., Liege
Consolidated Safety Valves

IN ITALY

Societa Carraro & Co., Milan
Consolidated Safety Valves
Hancock Temperature Regulators
Filotecnica Salmoiraghi—SPA, Milan
Ashcroft Duragauges
Ashcroft Pneumatic Transmitters

IN WESTERN GERMANY

Deutsche Babcock & Wilcox Dampfkessel-Werke, Oberhausen (Rheinl)
Consolidated Safety Relief Valves
Consolidated Safety Valves
Consolidated "Maxiflow" Safety Valves
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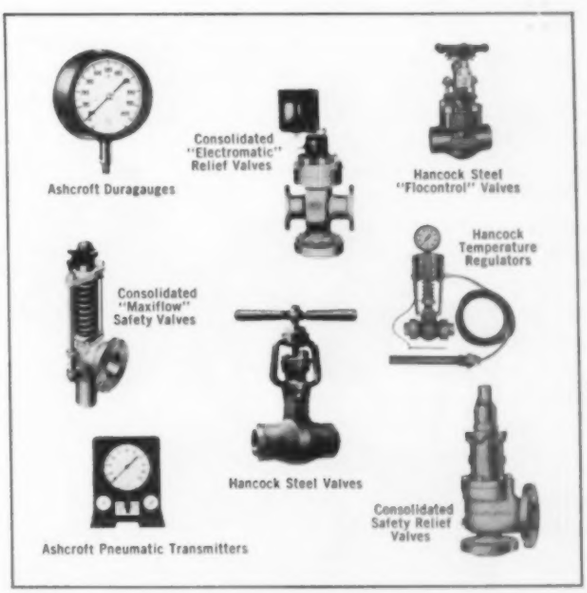

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NEW Westinghouse F/A Motors Provide FULL ACCESSIBILITY

For the first time, a unique "take-apart" construction exposes bearing housings and windings – quickly and completely – for inspection, cleaning, servicing.

In-plant experience shows F/A Motors can be completely disassembled in 90 minutes, reassembled in two hours – for a total maintenance downtime not exceeding 3½ hours! Removal of end covers, panels and air shields takes only 38 minutes, replacement another 56 minutes.

Westinghouse F/A Motors also provide: (1) quiet operation through stator isolation from housing; (2) Thermalastic® insulation, exclusive in all Westinghouse large motors, for extended service and coil protection; (3) cables through base, eliminating conduit boxes and making connection of motor leads easy.

F/A Motors are available in a full line of squirrel cage, wound rotor and synchronous types with ratings from 250 hp to 7,000 hp. For full information on these and other Westinghouse motors from 1 to 250 hp, see your Westinghouse distributor. Or write for bulletin 60-B, Westinghouse Electric International Co., 40 Wall Street, New York 5, U.S.A.

Electronic Computer Monitors World's Largest Crude Still

(Continued from page 72)

The Control System. With important variables clearly identified, the joint study team proceeded to apply computer control to the large crude still. Required were automatic means of collecting data, interpreting the information into control actions, incorporating a program for entering the data into a computer and getting the output back to the operator.

An annex 25 by 17 ft was constructed alongside the still control building to house equipment for monitoring the process.

A terminal unit, with no active components, interconnects the process and the data processing equipment. It matches process signals and also serves as a reference junction for thermocouple signals.

Process data, still in analog form, pass to a solid-state logic unit which sequentially scans the 196 inputs in about 75 seconds, amplifies these signals and converts them to digital form.

Digital information then passes to an input/output unit which transforms the signal into a code suitable for transmission over a single pair of telephone lines to Standard's administration building one mile away.

When the process data arrive in the building's IBM 704 room, cards may be punched, although this is not necessary, and at the same time the information may enter directly into an IBM 704. This computer is used for process control calculations on an "interrupt" basis. It has a "Realtime Package" and therefore can receive or send digital information in electrical form as opposed to conventional input or output via punched cards or magnetic tape. It is also equipped with an IBM 776 Conversion Unit which converts voltage to acceptable levels.

Scans may be initiated in any one of four ways. Two of them make use of Card Punch Unit which has a button and an interval timer for this purpose. There is also a scan button on the Input/Output Unit. Or, the 704 may be programmed to initiate a scan at desired time intervals.

Output of data is always done directly by the 704 via the Realtime Package. It is returned to the control building annex through the input/output units and printed out on an IBM 9323 remote typewriter. The print-out is used by operators to make the computer-developed control adjustments.

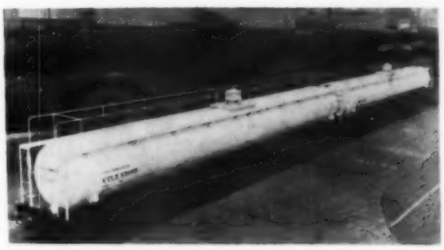
The control concept used includes two broad phases. The first seeks an accurate diagnosis of current operating conditions of the plant. The second involves optimization which leads to recommended adjustments to controller set points.

The diagnosis is developed as the computer scans automatically instrument readings from the 196 different instruments. Data may also be added manually based upon laboratory inspections. The best estimate of current operating conditions is obtained considering primary and other variables.

In the optimization function, values of constrained variables are compared with actual constraints. An approximate profit equation is also introduced, along with any other additional constraints imposed by management. Using linear programming techniques, 54 of 161 dependent variable equations are optimized to find the proper settings for up to 19 independent variables.

Optimization yields a detailed picture of the "room for improvement" existing in the current operating condition. Once this is established, it also determines the changes needed to take advantage of the projected improvement. To do this, the effects each primary variable change will have on each constrained variable must be considered. These effects are known as response coefficients, and actual values of the coefficients have been developed from chemical engineering calculations carried out on an incremental basis. It is also necessary to know how each controlled primary variable will affect the process profit.

With the capacity to handle the 75,000 instructions involved, the IBM 704 computer can carry out this entire search for the best operating condition. It eliminates the need to search for the optimum by performing systematic experiments on the actual processing unit. Another feature of optimizing with a computer is that it permits multi-controller adjustments. Formerly, one controller at a time was adjusted and the plant was allowed to settle down before further changes are made. END



30,000-gal Tank Cars Built

Union Tank Car Co. has completed delivery of 12 of the world's largest-capacity railroad tank cars to the Baton Rouge refinery of Esso Standard, Division of Humble Oil & Refining Co. The 30,000-gal cars will be used to transport ethyl ether. They were assembled at Union's Whiting, Indiana, plant, while the shells were fabricated at the East Chicago, Indiana, plant of Graver Tank & Mfg. Co., Division —Union Tank Car Co.

Employing Union's patented HD design, the 30,000 gallon cars were first introduced in May 1960. Two cars of this capacity are currently in interchange service, transporting liquefied petroleum gas.

Aluminum For Oil-Field Pipe

First commercial tests of newly developed aluminum drill pipe have been announced by Reynolds Metals Co. and Reed Roller Bit Co. Using Reynolds pipe and a new type of pipe joint invented by Reed for aluminum pipe, a rig used by Shell in Texas has drilled a 10,400-ft well. Though admittedly costing more than steel pipe, the advantages of the aluminum pipe are expected to more than offset the additional cost. The lighter weight of the aluminum permits a rig to lift much longer strings of pipe, substantially increasing its depth capacity. The aluminum pipe weighs 8.6 lb per ft, compared with 15 lb for steel pipe. It is claimed that a rig limited to 10,000 ft with steel pipe, for example, could go to 16,000 ft with aluminum pipe. Even with sharply curtailed drilling activity, it is expected a million and a half tons of steel pipe will be put into new wells during 1960.

Aluminum is likely to be used initially for specialized drilling problems, according to a Reed Roller Bit spokesman, who commented: "Within 10 years, you may see a considerable percentage of aluminum pipe being used in the oil industry."

HERE'S HOW
Westinghouse
MAKES MOTORS
TOUGHER

There's no substitute for actual in-the-field testing, particularly when the goal is to make a good motor even better.

The Westinghouse Life-Line "A" Guardistor oil well pumping motor driving this sucker rod pump had already undergone hundreds of torturing laboratory and shop tests. But then it was subjected to months of actual oil field service to prove it more than equal to the severest climatic and load conditions.

As the result of such intensive testing and constant improvement, you are sure of getting the ablest performers, incorporating the latest advances, when you specify Westinghouse motors. The Westinghouse Guardistor motor, for example, incorporates three tiny positive temperature coefficient thermistors in the windings themselves to provide positive protection against heat build-up regardless of cause — whether from overloading, inadequate ventilation, single phasing or other reason.

Similar advantages—all thoroughly proven in laboratory and field tests — enable Westinghouse motors in oil service everywhere to provide the highest standards of performance, reliability and economy.

Automatic fuel washing unit reduces tanker operating costs

AN AUTOMATIC FUEL WASHING system developed by Atlantic Refining Co. to reduce deposit forming tendencies in bunker fuels has demonstrated it can pay for itself in 30 months as the result of a year-long test on one of Atlantic's supertankers.

Savings can exceed half a million dollars over the 20-year life of a supertanker, according to W. A. Walls, port engineer of Atlantic's marine division, who described the method and equipment in a paper at a recent meeting of the Society of Naval Architects and Marine Engineers.

Walls explained that the recent trends to larger and faster tankers has introduced the serious problem of deposit accumulations within a ship's boilers. Higher operating temperatures and pressures cause slag from impurities in the heavy bunker fuel to build up on boiler tube surfaces. This requires frequent and costly repairs as well as delays in shipping schedules. The new system was installed about a year ago on the 30,000-dwt SS ATLANTIC SEAMAN. A final boiler inspection after 12 months operation showed little or no build-up of deposits.

The cost of the system as installed on the SEAMAN was $78,400, including $43,500 for the equipment and $34,900 for the installation.

Savings were calculated at $41,231 for the first year of operation. This includes $27,731 for a direct reduction in boiler costs and $13,500 in demurrage savings resulting from the elimination of emergency slag cleaning shutdowns.

Operating costs for the washing system, including repairs, utilities, and chemicals but no labor, were estimated at $10,200 per year.

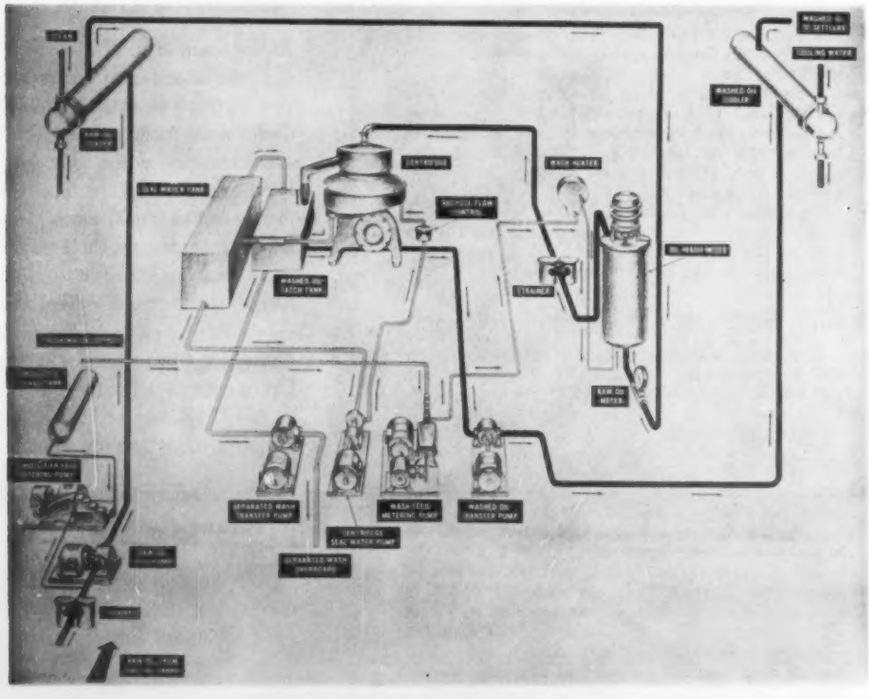
Thus, the net advantage in using the system was $31,031 per year (41,231—10,200). On the $78,400 initial investment, this is a payout time of 2.5 years, equivalent to about 39% return on investment when calculated by the Investor's Method.

The washing system has satisfied Atlantic so well that it is now being installed on two other presently operating supertankers and will be installed in two tankers now under construction for the company fleet. It can, of course, be applied to any bunker fuel burning ship, and considerable interest has been shown by the United States Navy as well as operators of commercial ships.

Table 1—Economics of Fuel Washing System

Average boiler costs per vessel per year, based on two ships operating nine years each and one operating eight years, and overall total adjusted to 1960 dollar basis.

Total, 26 vessel-years	$1,846,190
Average, per vessel per year	$ 71,007
Cost for one year on SS ATLANTIC SEAMAN, after purification system was installed	$43,276
Estimated reduction per vessel per year 71,007 — 43,276 =	$27,731
Investment in system: Equipment	$43,500
Installation	34,890
Total	78,390
	$ per year
Savings: average total boiler costs	$27,731
reduced demurrage	13,500
Total	$41,231
Operating costs (incl. repairs, utilities, chemicals, oil losses)	$10,200
Net advantage (savings less cost excl. depreciation)	$31,031
Payout time: $78,400/31,031 = 2.5 years	



Schematic flow chart shows fuel washing system used on Atlantic Refining Co.'s supertanker, the 30,000-dwt SEAMAN.

How the system operates. Most of the fuel washing equipment is installed in an area measuring about 10 x 10 x 7 ft, just aft of the port boiler, in the fireroom of the SEAMAN (See illustrations). Used principally to remove sodium, the unit is started as soon as the fuel has been taken aboard the ship. Once on stream, it operates at a rate slightly above that of the actual fuel consumption.

Raw bunker fuel is strained and then fed through a charge pump where it picks up a small quantity of demulsifying agent (0.6 cc per gal of fuel). It is then passed through a continuous heater and, at a temperature of about 200°F, goes on to an oil wash mixer where preheated water (at 200°F) is added at a 5 vol-% rate to dissolve the soluble salts.

This mixture is then pumped through a globe mix valve and into a tank equipped with a high speed propeller mixer and internal baffle. The mix tank is sized for two to three minutes of holdup. Water soluble salts in the oil, principally sodium salts, are extracted by the water phase of the emulsion.

After passing through another strainer, the mix goes into a special "Gravitol Centrifuge" which was supplied as a package unit by Sharples Corp. of Philadelphia. The centrifuge separates the fuel oil from the water, the water phase carrying with it the soluble salts, the purified oil phase being returned through a cooler and settlers to storage.

(Continued on page 96)

Here's data on the ideal pump for petroleum processing applications

Announcing NEW DE LAVAL IMO Pump Bulletin

New Bulletin 3200 contains all the data you need on De Laval IMO constant-displacement, rotary, screw type pumps. In its pages you will find (1) extensive application data including charts on fuel oil, SAE oil, and turbine oil viscosities; (2) selection information, including specific examples; (3) complete performance data on each IMO model as well as (4) dimension drawings and tables. Write today for your copy of this valuable, 40-page bulletin on the unique IMO pump.

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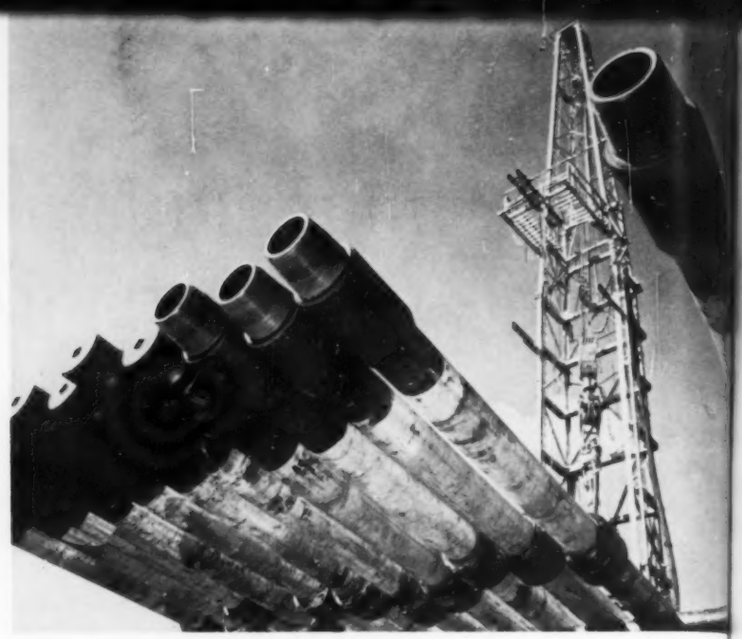
DL-220

Aluminum drill stem packed in "hay rake" of Shell Oil derrick during first successful commercial test of full aluminum drill string at Yorktown, Texas.



Close-up of Reynolds aluminum drill pipe with Reed tool joints.

Shell completes 10,400-ft. well with aluminum drill pipe

SHELL OIL CO. HAS completed its Alvin F. Sievers 1 in DeWitt county, Texas at a depth of 10,400 ft with its Rig 25 which was designed for depths to 7,000 ft. The record was made by Shell through the use of aluminum drill pipe in combination with steel tool joints which reduced the weight of pipe in the hole about 40%.

The successful experiment in drilling with lightweight pipe was the culmination of a 6-year research program carried out by Reed Roller Bit Co. and Reynolds Metals Co. The aluminum drill pipe used in the experiment is a rugged alloy in Reynolds' "heavy end" pipe designed for maximum strength at joints. The special tool joints were engineered by Reed under pending patents.

From the standpoint of various strength factors, extensive laboratory tests indicate the aluminum drill pipe is equivalent to or exceeds grade E steel pipe, according to W. G. Reynolds, executive vice president of Reynolds Metals. Fatigue endurance of the aluminum drill stem and tool joint assembly has proved in lab tests to be 800,000 to 1,500,000 cycles, compared with 500,000 to 800,000 cycles for grade E steel pipe and hand applied tool joint assemblies under the same loading conditions.

A 4½-inch aluminum pipe, in air, weighs only 8.60 lb/ft compared with 15 lb for steel, or a difference of almost 200 lb per 30-ft section. The weight differential is even greater in drilling mud. For example, in 10-pound mud, a joint of Range 2 aluminum pipe weighs 218 pounds compared to steel's 455 pounds.

The steel tool joint used on the aluminum drill stem embodies the latest developments in Reed's "Inarclad-60" hard metal process to guarantee ruggedness, according to John Maher, Reed president.

Reed has also used a special process to facilitate the successful attachment of the steel tool joints to the aluminum pipe. Reed and Reynolds made more than 60 full-scale laboratory fatigue tests on the tool-jointed aluminum drill pipe before attaining a satisfactory tool joint assembly.

Mr. Reynolds said that handling of aluminum drill pipe is simplified both during use and during relocation because: from 1/3 to ½ less horsepower is needed to pull and run an aluminum string, resulting in reduced hoisting costs; lighter rigs can be used; more footage of drill pipe can be carried per truckload when the pipe is moved to a new location cutting transportation costs; and it takes less horsepower to pump mud through the aluminum pipe than through steel pipe because of the smooth bore of the extruded aluminum pipe.

"Aluminum's high scrap value offers still another advantage," Mr. Reynolds stated. "At present scrap market prices, a return of approximately $1.75 per foot can be realized after a piece of aluminum drill pipe becomes unusuable."

The aluminum drill pipe is also expected to be advantageous in "whipstocking," or directional drilling. This is because aluminum pipe can be deflected to the same degree as steel pipe with less bending stress, and hence, far greater fatigue life.

And, while API Range 2 steel drill pipe can vary in length from 28 to 32 feet, the Reynolds aluminum drill pipe will vary no more than ½ inch from a standard 30-foot length, shoulder to shoulder on the tool joints, all on the plus side of 30 feet. This makes tallying of drilling depth simpler and possibly will provide more accurate well logging.

The inherent qualities of the aluminum drill string are enhanced by the use of Reed Super Shrink-Grip hand applied tool joints. In case of damaged or worn drill pipe, joints can be reclaimed and reapplied to new pipe at the rig site.

There have been no signs of pitting or galvanic type corrosion in any of Reynolds' extensive tests on the aluminum pipe. The amount of wear from abrasion has been no worse than is normally encountered with steel pipe.

Reynolds first started private field tests of the aluminum drill pipe six years ago with 500 feet of 4½-inch pipe in 20-foot lengths with steel joints. The 500-foot test string accumulated 60,000 feet of drilling in the earlier tests before being "laid down" for thorough examination and evaluation. The results encouraged Reynolds to carry the development on, culminating in today's string of light weight high strength pipe.

END

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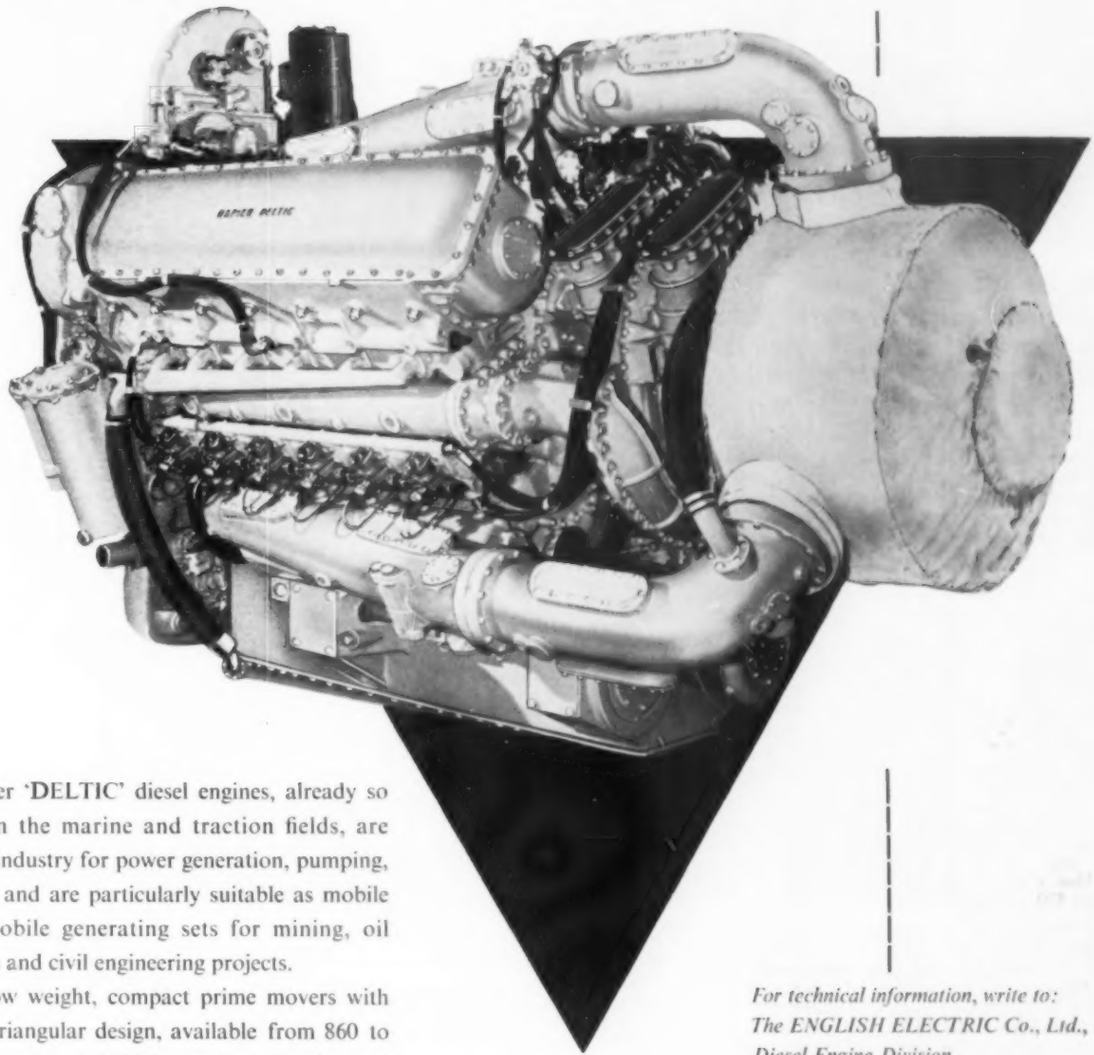

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by William C. Uhl
Processing Editor

Highlights of the month—new market for fuel oil in steel making; fluid process improves phthalic anhydride production; olefins from catalytic cracking unit cycle oil; and new process for recovering sulfur from natural gas

Both oil and steel men are keeping a close watch on an experimental project now taking place in the blast furnace of a Hamilton, Ontario, steel plant—oil men because the successful outcome of the experiment could mean a healthy increase in the market for heavy fuel oils, steel men because success could mean a much desired increase in manufacturing efficiency.

Object of the study is to determine whether fuel oils can be burned in blast furnaces. It is a joint program by Imperial Oil Ltd., Esso Research & Engineering Co., and Dominion Foundries & Steel Ltd.

Called hydrocarbon injection, the technique aims at using the oil to provide a part of the heat and the combustion gases required to reduce iron oxide to iron. Oil is injected through a special nozzle running inside each of the hot air blow pipes. The equipment is designed for installation without a shutdown of the furnace.

The process permits immediate increase in furnace production because it provides additional room inside the furnace for more ore and limestone. Thus, existing equipment can turn out more finished metal; a new blast furnace with related auxiliaries would cost about $20 million.

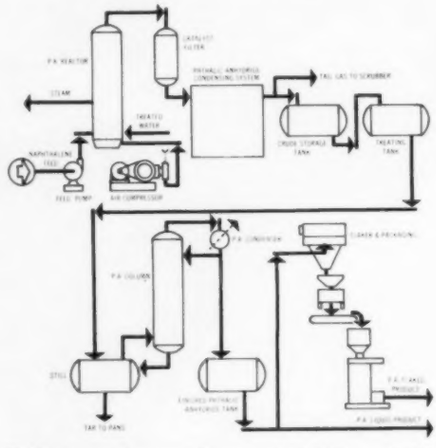
Esso Research began studying the problem back in 1958, then one year ago undertook discussions with Imperial and Dominion Foundries, started studies of nozzle designs, and established a pilot plant, 20 ft high by 3 ft in diameter, which simulated the important blast furnace conditions. Last summer, completed pilot studies confirmed all earlier expectations, and today the full-scale test is under way at Hamilton.

A substantial increase in the fuel oil market can conceivably result. If the process were widely adopted in the USA steel industry alone, it would mean an estimated increase in fuel oil sales of about 300,000 barrels daily.

The technique can operate on a variety of fuels, including natural gas. Work has been reported to be going on both in the USA and continental Europe using natural gas. In any event, success at Hamilton can well be expected to lead to a good boost to sagging petroleum products markets as well as a boost to the metal industry.

Wherever and whenever fluidization had been tried in refining and/or petrochemical processing, a number of inherent advantages have helped its rather rapid adoption.

One of the more recent petrochemical processes in which fluidization is growing in popularity is the manufacture of phthalic anhydride. The completion of a new 30 million lb/yr phthalic anhydride plant at the Elizabeth, N. J., works of Reichhold Chemicals, Inc. by Badger Manufacturing Co. this fall marked the point at which five producers had selected this fluid bed process. Furthermore, of these five (including RCI), four had manufactured phthalic anhydride by the fixed bed process in the past. Since that time, Monsanto has raised the score to six and five. (See news item below.)



Fluid process for manufacture of phthalic anyhdride

The new fluidized bed plants will raise today's total world production of the material by almost 15%. The RCI plant is based on a design developed by Sherwin-Williams for its own highly successful unit in Chicago. Badger has arranged to sub-license the S-W process, know-how, and operating experience.

Among the advantages users have found are these:

(1) Temperature can be closely controlled in a fluidized bed of catalyst, even though this is a difficult accomplishment in this particular reaction because of the large amount of heat evolved during the oxidation of the naphthalene. And, temperature control is important because temperature variations will convert the naphthalene to other materials or completely oxidize it to carbon dioxide and water.

(2) A higher potential yield results from the improved conversion in the reactor because of the close temperature control. Product purity is high. Badger reports that a typical analysis from a full-scale operating plant showed 99.7 wt-% phthalic anhydride and 0.02 wt-% maleic anhydride in the product.

(3) Air requirements are lower, and safety is higher. Fixed bed plants usually operate at, or close to, the lower explosive limit of the feed mixture. Therefore, they require four to five times the quantity of theoretical air requirements. In fluidized beds, the suspended catalyst acts effectively to prevent explosions. Lower air requirements in turn reduce air compression cost, decrease pipe sizes in the oxidation section, and permit a smaller condensation system.

(4) Operation and maintenance is generally lower for fluid bed plants, and some auxiliary heat removal methods are not needed, such as mercury vaporization or salt circulation.

If everybody keeps "scraping the bottom of the barrel" there may come a time when processors will have to find a way to make a bigger barrel or a bigger bottom. The use of hydrocracking to obtain lighter ends from resids is already well known. And now comes an approach to making olefins for petrochemicals from catalytic cracking unit bottoms.

The technique was discussed by R. A. Franz of Lion Oil Co. division, Monsanto Chemical Co., in a paper at the Tulsa meeting of the American Institute of Chemical Engineers this fall. The paraffinic raffinate obtained by furfural extraction of a heavy cat cycle oil was thermally cracked in the presence of steam to a product from which liquid alpha-olefins were separated by distillation.

Cracking was carried out in a small laboratory unit comprising a 1-in. by 24-in. stainless steel reactor filled with ¼-in. alundum heat exchange pellets. A 35 wt-% yield of C_5-C_{15} olefins, based on consumed charge, was attained.

Wax cracking is relatively common practice in Europe, primarily because paraffin wax is a drug on the market. The detergent "Teepol" is made by fractionating the olefins from wax cracking, then reacting them with sulfuric acid and caustic.

In the USA, the milk carton business provides a good market for paraffin wax. Mr. Franz pointed out, however, that there is considerable paraffin in the heavy catalytic cycle oil, which usually contains about a half-and-half mixture of paraffins and aromatics, with a boiling range of 550 to 850°F. These paraffins can be separated readily by solvent extraction and serve as a low cost raw material for olefins.

The work is still being carried on, and the Lion Oil man explained that there are many questions that still need to be solved.

A recently developed, low-cost sulfur recovery process, particularly useful for sour natural gas, is to be tried in a 100,000 cf/d pilot plant in Alberta. Process design for the pilot unit was developed by Harry Haines, president of Western Sulphur Recovery Ltd. and inventor of the process. The pilot plant location has not been announced yet; it will be built by Maloney-Crawford Tank & Service Co. Ltd. of Calgary, Alberta.

The process is similar to those used in short-cycle hydrocarbon recovery units, although it uses a different adsorbent and a new type of regeneration cycle. The adsorbent is a calcium aluminosilicate, manufactured in the form of a synthetic crystalline zeolite. This type of zeolite is an excellent Claus catalyst, Haines said. When "loaded" with hydrogen sulfide, it can be regenerated at 600°F with sulfur dioxide to produce sulfur vapor and water vapor. Liquid sulfur is recovered by condensation.

The process is expected to demonstrate considerable savings over conventional techniques because it dehydrates, sweetens, and produces sulfur from, sour gases in a single plant.

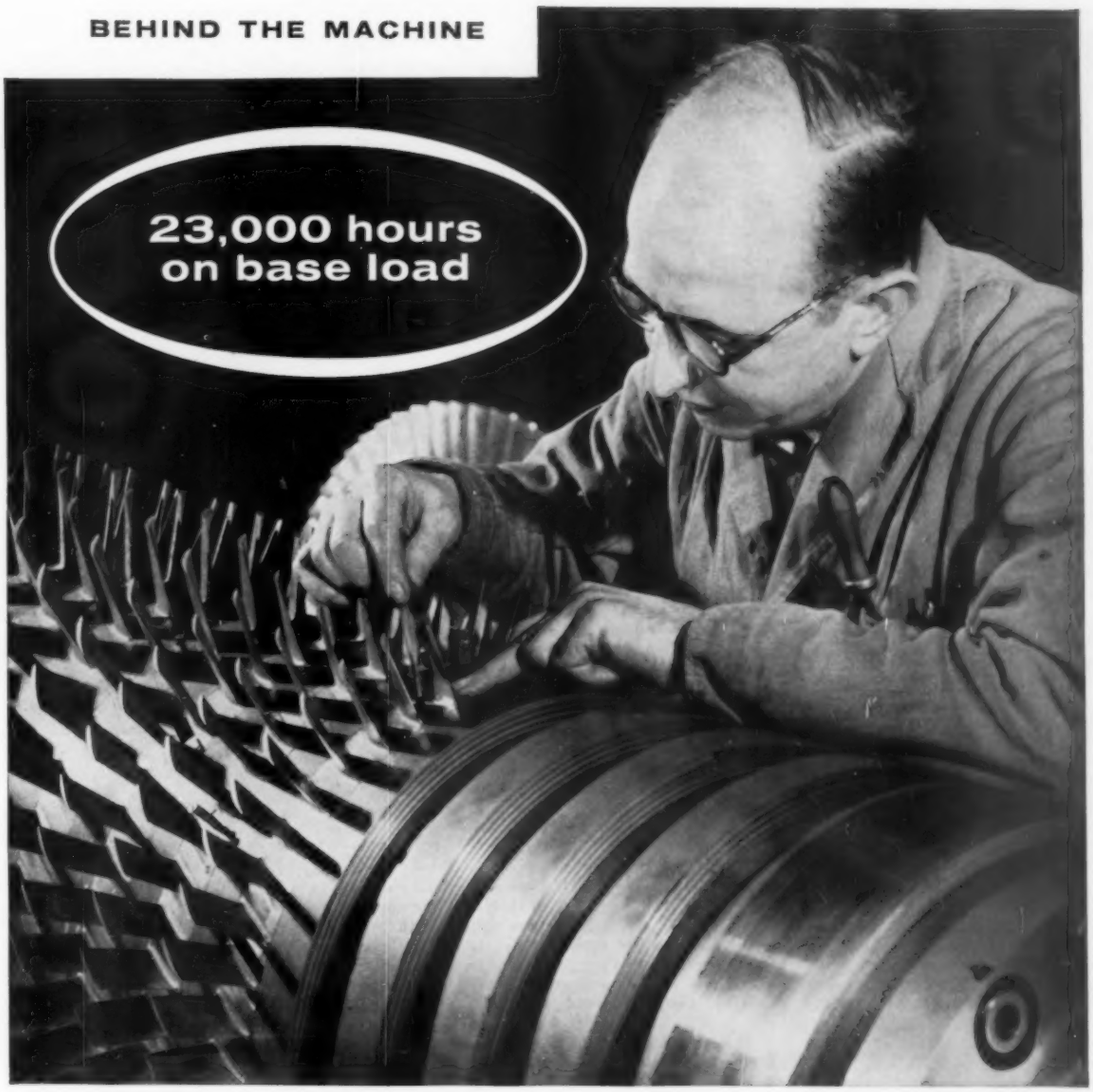
Cost was estimated for a commercial plant to treat 8 mmcf/d sour natural gas containing 15% hydrogen sulfide (about 40 ton/day of sulfur) at about $600,000, exclusive of off-site facilities.

In operation, the unit operates on cycles varying from 45 to 180 minutes, as determined by sour gas concentration. Flow is by series through two towers. Sour gas flows up through the adsorption tower, through a gas cooler, and then down through a cooling tower to cool freshly regenerated adsorbent. Then it goes through one more cooler and on to the sales gas pipeline. Series flow provides a safety factor; in the event of an upset, the cooling tower acts as secondary absorber.

About a third of the liquid sulfur from the condenser is recycled to a sulfur burner to produce sulfur dioxide gases, which pass through a waste heat boiler and then to a trim cooler for accurate temperature control. These gases then flow downward through the catalyst regeneration tower for simultaneous stripping of, and reaction with, the adsorbed hydrogen sulfide.

(*Continued on page* 82)

BEHIND THE MACHINE



The proved reliability of AEI industrial gas turbines is typified by a machine in Venezuela which has recently completed 23,000 hours running on base load. AEI makes a range of industrial gas turbines with ratings from 1,750 kW upwards designed to run on gaseous or liquid fuels.

The picture shows work on the compressor rotor of L2IC gas turbines being built, at the AEI Turbine-Generator Division Factory for the Basrah Petroleum Co. These feature a single shaft design which ensures stable regulation and makes them particularly suitable for parallel operation with other generating equipment.

This is a product of AEI Turbine-Generator Division, Britain's largest manufacturer of Turbine-Generators.

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B/L002

Vapors from the bottom of this tower enter the condenser where the liquid sulfur is produced, non-condensable gases being vented to atmosphere.

Relatively high pressure steam is produced in the waste heat boiler, which has an exit temperature near that of the regeneration tower, about 600°F. Excess steam can be used to drive a refrigeration system to reduce dewpoint of the sales gas, important in Canada, where transmission companies require a 15°F hydrocarbon dewpoint at 800 psia.

What's New in Processing Plants

Oelwerke Julius Schindler GmbH, one of BP's associate companies, expects to complete during the first half of 1961 a new $7.56 million, 2,000 b/d Edeleanu dewaxing unit and other modernizations at its Neuhof refinery, near Hamburg, Germany.

• • •

Standard Oil Co. (Ohio), granted the first license to use California Research Corp.'s new Isocracking process, will build a 7,500 b/d Isocracker at Toledo, Ohio, to convert straight run and cracked gas oils to gasoline.

• • •

Gulf Oil Corp. plans a new 30,000 b/d refinery in either Denmark or Sweden, and is now acquiring options on land sites in both countries suitable for locating the proposed plant.

• • •

Preliminary work will start early in 1961 on the Indian Government refinery proposed for Gujarat State to process Cambay oil, with Indian engineers trained in Rumania handling the work. Proposal anticipates that technicals help and equipment will also come from Soviet sources.

• • •

Compania Petrolera Delhi Guatemala S.A. has asked government approval to build an $8.8 million, 10,000 b/d refinery at Matias de Galvez, Guatemala's major Caribbean port. Plant would produce two grades of gasoline, kerosine, diesel oil and fuel oil. It is reported that the investment will involve 70% USA capital and 30% Guatemalan.

• • •

Shell Oil Co. of Canada will complete construction before the end of 1961 of a $20 million gas processing and sulfur plant in the Pincher Creek District of southern Alberta, designed initially to produce 100 mmcf/d of gas for delivery to Alberta and Southern Gas Co. Ltd. for export to the USA, as well as 1,000 ton/day of sulfur and 3,500 to 4,000 b/d of liquid products.

• • •

British American Oil Co. Ltd. has completed the $1.5 million expansion and modernization program at its Calgary, Alta., refinery, including increase of crude capacity to 10,000 b/d from previous 7,500 b/d, addition of a 3,500 b/d naphtha desulfurizer, and raising catalytic reforming capacity to 3,000 b/d, plus a new 60,000 lb/hr steam plant. Flour Corp. of Canada Ltd. designed and constructed the desulfurizer.

• • •

Raffinerie Belge des Petroles S.A. has completed construction of a 7,000 b/d catalytic desulfurization unit at its Antwerp, Belgium, refinery. Construction is now under way on a 24,000 ton/yr LPG plant and an 800 ton/day asphalt unit.

• • •

Iranian Oil Refining Co. has awarded Fluor Engineering & Construction Co. London, contract for design, engineering, and procurement for a 20,000 b/d UOP Unifiner-Platformer at Abadan, with completion scheduled for early in 1962.

• • •

Guatemala's first refinery, a 4,000 b/d plant which is expected onstream early in 1961, and being built by The Lummus Co. for Breaux Bridge Oil Refining Co. near Puerto Barrios, will include a 2,600 b/d desulfurizer and a 1,200 b/d catalytic reforming unit. Primarily prefabricated at Lummus' Houston, Texas, facilities, the plant is said to be the largest complete refinery ever designed and built on a portable basis.

• • •

What's New in Petrochemicals

British Hydrocarbon Chemicals Ltd. (BP and Distillers Co. Ltd.) plans a major expansion of manufacturing at a new location in South Wales, England. Initial investment is expected to be about $28 million. Proposed site of several hundred acres will be near the BP refinery at Llandarcy, and operations will follow generally those at Grangemouth.

• • •

British Petroleum Co. and California Chemical Co. plan a $19.6 million joint venture involving two new aromatics plants, adjacent the BP refineries at the Isle of Grain, Kent, England, and Dinslaken, West Germany. The joint undertaking will be known as BP California, and BP will operate the units. Initially, the installations will produce annually 19,000 tons of orthoxylene, 16,000 tons of ethyl benzene, and 22,000 tons of paraxylene. First production is scheduled for late 1961.

• • •

Shell Chemical Co.'s new 40 million lb/yr polyisoprene unit is onstream at Torrance, Calif., the second installation to be completed in the company's program of expanding polyisoprene output to 120 million lb/yr.

• • •

Firestone Tire & Rubber Co.'s new Orange, Texas, polymer plant, scheduled for completion in January, will boost the company's synthetic rubber capacity, presently 251,000 ton/yr, by 12%, or 30,000 ton/yr. Products will include "Coral," a new synthetic natural material, and "Diene," an extender for use with natural in tire production.

• • •

Japanese government has approved the establishment of a joint enterprise by Showa Denko and du Pont to construct a neoprene plant not to exceed 8,000 ton/yr. Project will be capitalized at $9.75 million, and site has not been disclosed.

• • •

Celanese Corp. of America is building the USA's first full-scale facilities for producing 1,3-butylene glycol at Bishop, Texas. Construction of the 25 million lb/yr unit is to be completed during the first quarter of 1961. Company is the sole USA producer of the material.

• • •

Monsanto Chemical Co. has awarded contract for the design, engineering, and construction of its recently announced phthalic anhydride plant in Gloucester County, N. J., to Badger Mfg. Co. Using the Sherwin-Williams fluid bed catalytic process licensed exclusively through Badger, this is the sixth such project at Badger—and the fifth for clients who have historically used fixed bed processes. The new unit will increase Monsanto's phthalic anhydride capacity by more than 30%. Completion is expected by early 1962.

• • •

Hercules Powder Co. has awarded Catalytic Construction Co. a contract to perform the maintenance services on its new multi-million dollar polypropylene plant now nearing completion at Lake Charles, La. Arrangement calls for Catalytic to supply services for all routine work as well as peak forces needed during unit turnarounds.

• • •

Jefferson Chemical Co. has completed modifications and new construction at the plant it acquired in Conroe, Texas, about one year ago. Unit is now producing polypropylene glycol and propylene oxide triols, as well as morpholine, and other specialties.

• • •

Solvay Process Division, Allied Chemical Corp., plans expansion of chlorinated methane capacity at Moundsville, W. Va., by about 40%.

• • •

ANIC of Italy has completed a 20,000 ton/yr Houdry Dehydrogenation unit for manufacture of butadiene at Ravenna, Italy.

• • •

Witco Chemical Co. has awarded Scientific Design Co. Inc. the engineering and construction contract for its 30 million lb/yr phthalic anhydride plant to be completed before the end of 1961 at an undisclosed site on the USA East Coast. Plant will use an SD process, and is second such plant in the USA, the first being Witco's 20 million lb/yr unit in Chicago, onstream earlier this year.

• • •

Shell Chemical Co. will build a new 80 million lb/yr polypropylene plant at West Deptford, N. J., using a new process developed in a four-year, multi-million dollar research program.

• • •

The first Scientific Design Co. phthalic anhydride plant using ortho-xylene as feedstock is now being designed and constructed for Cie Francaise des Matieses Colorantes (Francolor) at Villers-St-Paul, France, by Soc. Francaise des Services Techniques, a member of the SD Group.

U. S. Phosphoric Products, Tampa, Fla., has awarded contract to Chemical Construction Corp. for a natural gas-to-ammonia plant with 350 ton/day capacity, for completion in late 1961, and featuring an ammonia synthesis converter with largest single designed capacity in the world.

• • •

Petroleum Chemicals Inc. is increasing Lake Charles, La., capacity for production of high-purity propylene by 120 million lb/yr.

• • •

Standard Oil Co. of California will complete early in 1962 a $17 million facility at Richmond, Calif., with 41 million lb/yr capacity for paraxylene and 100 million lb/yr of high purity ortho-xylene.

• • •

Rheinpreussen A.G. is building a 13.2 million lb/yr maleic anhydride plant (initial capacity) at Hamburg, Germany, using a Scientific Design Co. licensed process. SD will provide complete process design and engineering.

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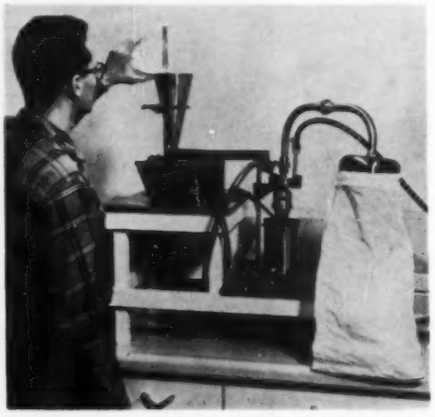


Shell spectroscopist feeds sample to Sturtevant fluid energy mill, the "Micronizer."

Tiny Mill Aids Catalyst Analysis

A tiny fluid energy mill is helping Shell Oil's Houston, Texas, laboratories obtain infrared spectrometric analyses of highly improved accuracy on solid samples such as catalysts.

A two-inch diameter, 20 gram/minute, stainless steel "Micronizer" made by Sturtevant Mill Co., the device pulverizes particles by interimpaction, giving a relatively uniform particle size (generally below 5 microns), and allows dry-pressing into pellets. Dispersed with potassium bromide, the particles are pressed into thin discs which can then be analyzed.

Infrared spectra of the particles in the potassium bromide pellet show little or no scattered energy, providing the particles have been fine-ground to smaller dimensions than the wavelength of the incident radiation. It is for this reason—the possible loss of energy due to the scattering of the beam by diverse multi-sized particles—that the fine grinding is important.

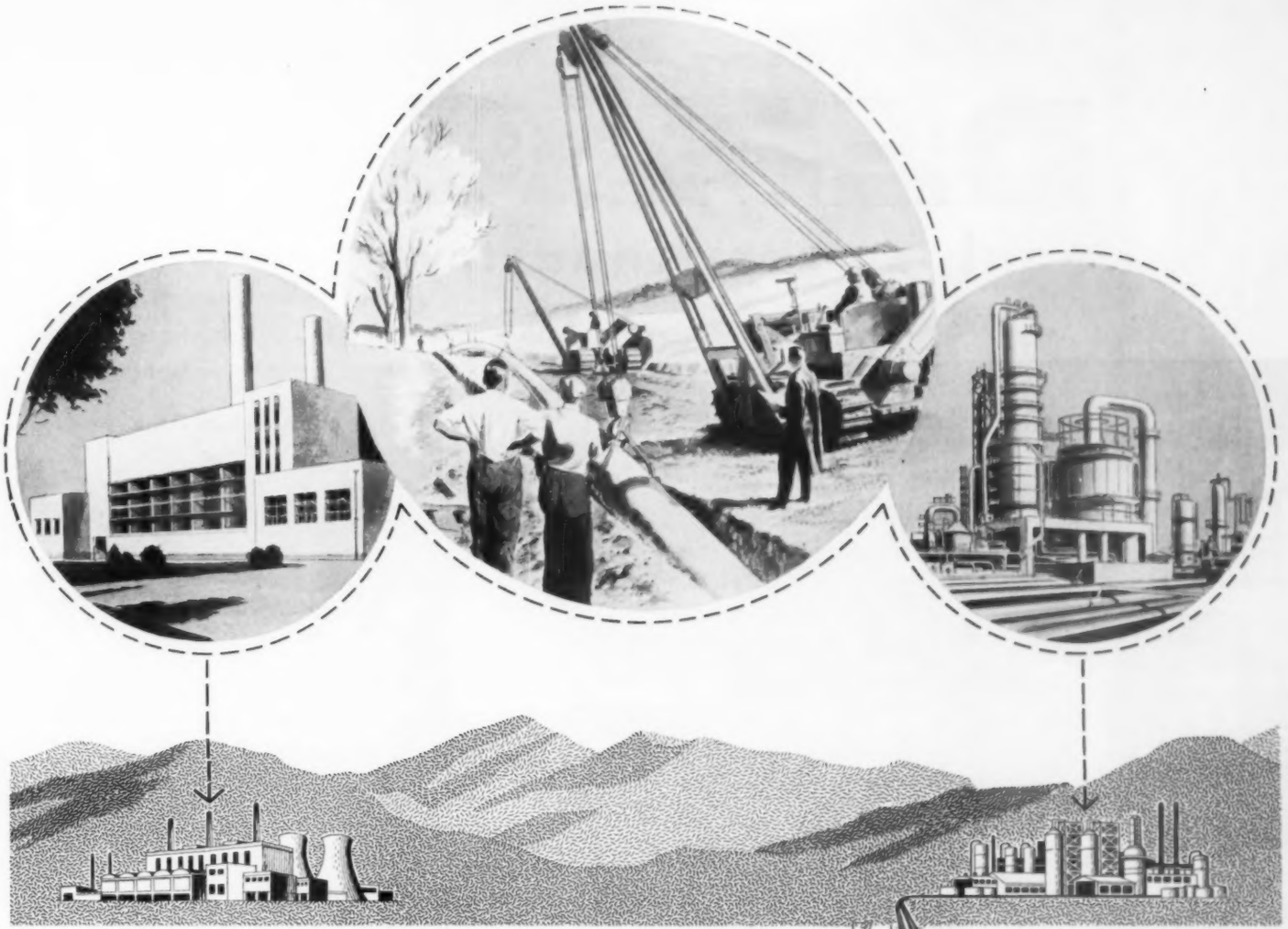
In the Micronizer, sample is fed through a venturi into a line of tangential jets through which air at 90 to 100 psi is flowing at 25 cfm. Particles thus impact one another, centrifugal force keeping the oversize in the grinding zone and diverting the selected sizes to the center where they fall by gravity into a collector.

Before the Micronizer was installed, Shell was grinding samples by hand. The laboratory has found that the device not only improves accuracy of analysis, but also increases efficiency and reduces the time required for such tests.

Sinclair Coordinates Computer Activities

A special department has been formed by Sinclair Oil Corp. to coordinate the expanding electronic data processing and computing activities of its operating subsidiaries. The new Electronics Department will be under Dr. K. A. Smith as manager and A. J. Piemonte as coordinator of data processing.

Dr. Smith, most recently director of economics analysis at the Sinclair Research Laboratories in Harvey, Ill., has served in research and managerial posts at Harvey. Mr. Piemonte has been data processing coordinator in the comptroller's department.



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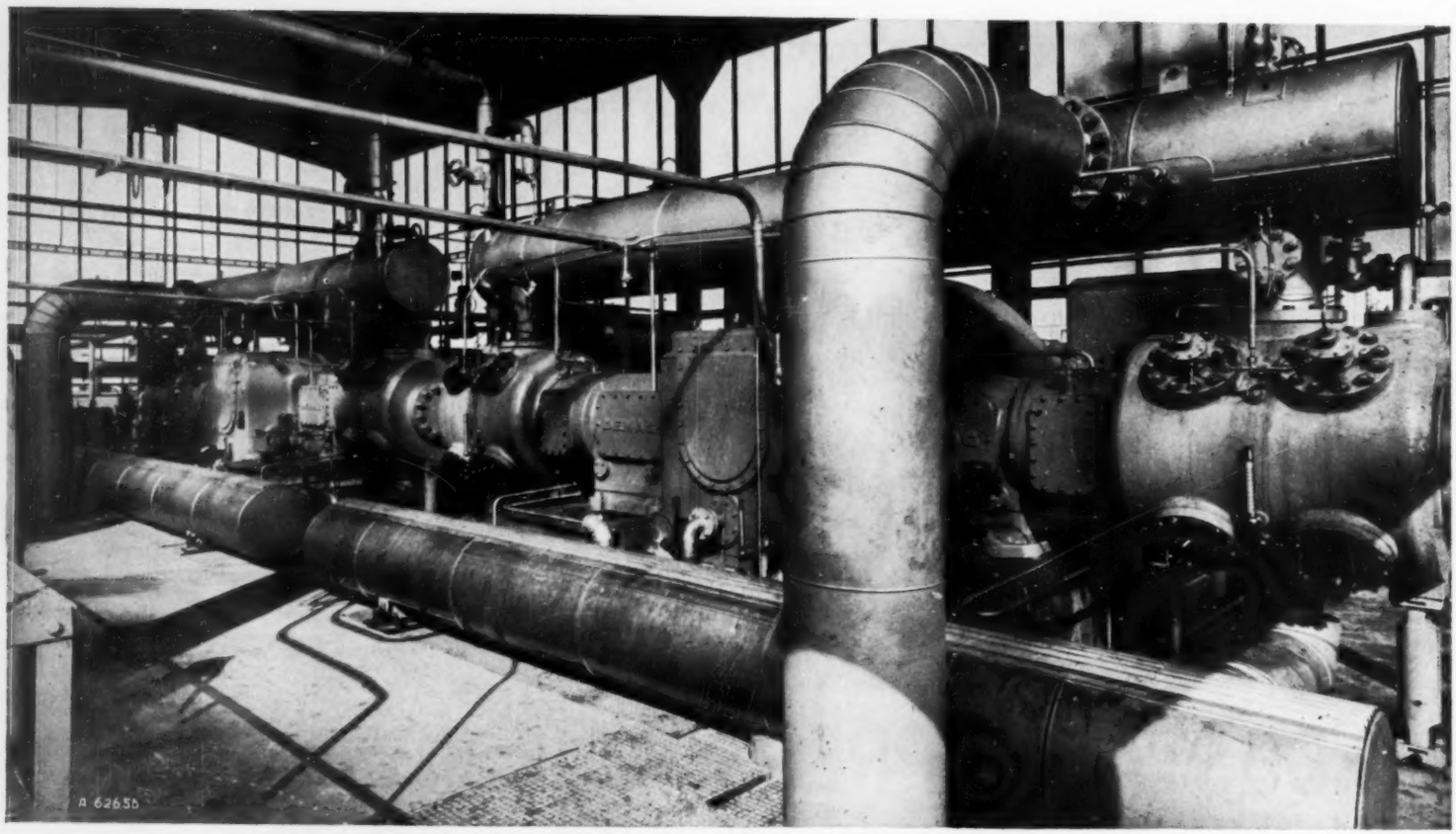

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Venezuela's Changing Oil Policy

(*Continued from page 42*)

Sheikh Tariki arranged a conference in Baghdad which was attended by Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and Venezuela. There, the important step was taken of setting up the Organization of Petroleum Exporting Countries (OPEC), and a resolution was issued on September 24 in which the participating nations put on a united front and agreed, among other things, to study ways and means of stabilizing prices through limitations on production.

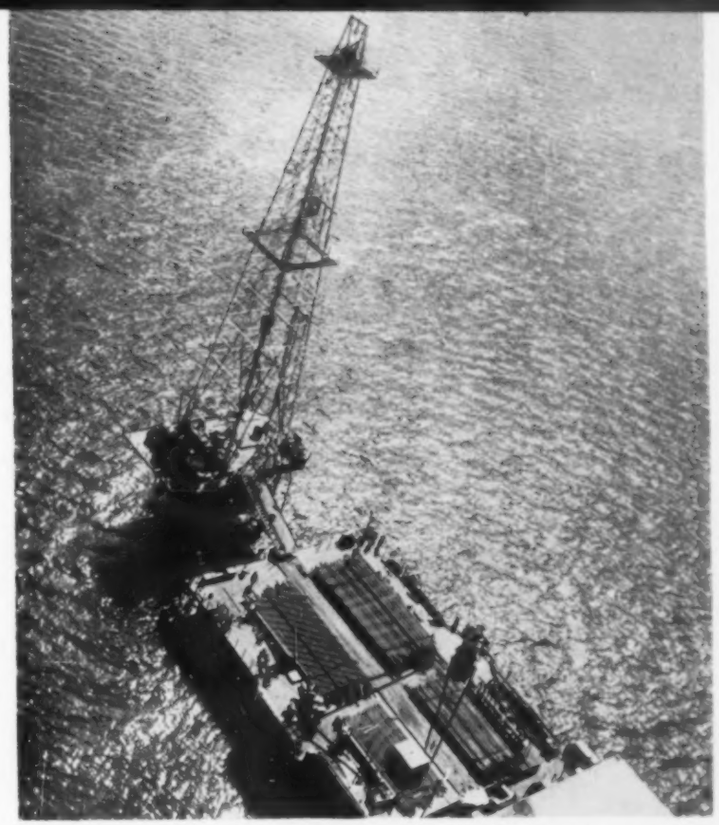
This undoubtedly marked a mile-stone on the road toward worldwide proration, since both Iraq and Iran had been lukewarm to the proposals. Moreover Iran, as supplier to Israel and with bitter memories of the way in which production was rapidly increased in the Arab States at the time of the Iranian nationalization, was regarded as a prime obstacle to smooth cooperation.

It is impossible to view the Venezuelan Middle East proposals without some sympathy, particularly when they are seen against the wider background of economic development in Latin America. Growth in the per capita gross national product in Latin America has come to a virtual standstill in the past three years; the prices of most of her staple export commodities have fallen; and the prices of most of her imports have risen. It must seem apparent to many Latin American governments that the best solution for this situation is not U. S. aid but improved export prices plus, in some cases, freer access to the U. S. market. U. S. aid, on a possibly intermittent basis, is psychologically unsatisfactory both to the U. S. and to the recipient.

Worldwide proration faces formidable obstacles, for there are several minimal conditions which must be satisfied before it can work. It must first of all have the full support of the Persian Gulf States. A display of unity and the adoption of the September resolutions can only be regarded as the first step. To succeed, there must be continuing cooperation and good will between the parties involved—a tall order when there are so many other political considerations entering into play. Can there, for instance, be any permanent rapprochement between Iran and the Arab States as long as the former persists in disregarding the Arab oil boycott on Israel?

A second condition, assuming the countries involved can agree not only on the principle involved but on a method to implement it, must be a willingness to move over and lose market position (but not necessarily volume) to smaller producers and newcomers. Venezuela, with its relatively limited reserves, is willing to go this far, but it would require considerable self-restraint on the part of, say, Kuwait and Saudi Arabia, with their huge reserves, to allow their market position to seep away.

The path toward acceptance of the proposals might be clearer if the active cooperation of the major oil companies could be obtained. Despite the obvious financial gains that would accrue to the majors in the short-run, not one of them has endorsed



Drilling barge in Lake Maracaibo (Cia. Shell photo)

Dr. Perez Alfonso's plan, and only one of the international "Independents"—Atlantic—has done so. The producing companies have a natural aversion to government controls of any kind, reinforced by a belief that it would be folly to allow the level of their gross income to be determined by government decree. Moreover, they could never willingly agree to a system of allowables which would put them virtually at the mercy of the governments administering it. Instead, the companies have been at some pains to maintain that the present surplus is temporary and to highlight some of the dangers of proration schemes in general.

Opposition to U. S. import controls has, of course, been a constant theme of Venezuelan government oil policy. However, the present government has provided a new twist by opposing not so much the restrictions themselves as the manner in which they are administered. It must be particularly irritating that crude quotas are in effect (through an elaborate system of exchanges) bought and sold in the U. S. at the expense of the exporting country, so that not only does Venezuela see its exports to the U. S. reduced but also its per barrel realization. Venezuela has sought to have the U. S. assign quotas by countries. This, in turn, would enable the Venezuelan government to dis-

(*Continued on page 88*)

Artisan Training Center at Cabimas, built by Compania Shell de Venezuela in 1955. It specializes in electricity, mechanics, transportation engineering, etc. It is attended by 500 students whose ages range from 16 to 20. On completion of his training, the graduate is offered a job in the company.

Esso adopt Fibreglass Crown with Stud Welding Technique

This tank at Esso's Tynemouth terminal is getting the latest in insulation treatment—Fibreglass Crown with Stud Welding Technique. This has been devised jointly by Crompton Parkinson (Stud Welding) Limited, makers of 'Setlok' Studs and Fibreglass Limited, makers of Crown insulation.

Fibreglass Crown with the Stud Welding Technique has four main advantages over the methods it replaces. It costs considerably less; it is quicker; it is easier to apply; and it provides better insulation.

Fibreglass Crown with its special attributes—not the least important its exceptional tear strength—is particularly suitable for this method of insulation.

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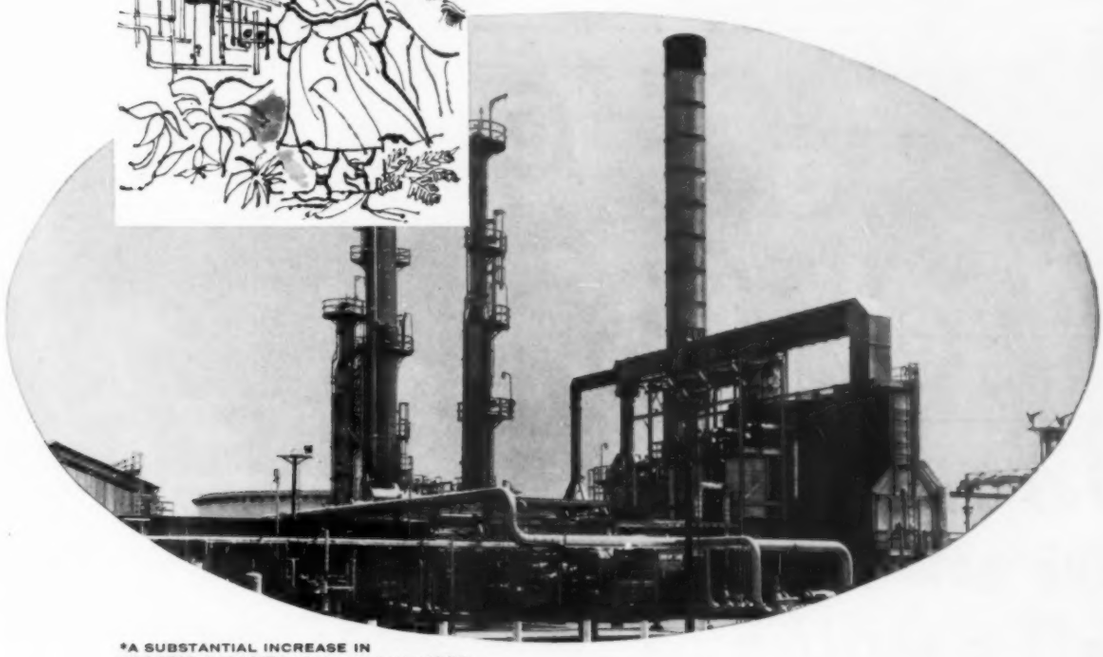

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Venezuela's Changing Oil Policy

(Continued from page 85)

tribute its quota among the various companies in Venezuela, thus presumably assuring the success of its own, newly created Venezuelan Petroleum Corp. Not unnaturally, the private oil companies are firmly opposed to any such system, and would prefer to live quietly with the shortcomings of the present one.

A major innovation in Venezuelan oil policy, after the overthrow of the old regime, was the definitive sealing off of new oil development (beyond the terms of then existing concessions) from private enterprise. It was officially announced that no more concessions would be given to private oil companies, and that a government-owned Venezulean Petroleum Corp. would henceforward undertake the development of any new areas not already under concession, as well as the refining, transportation and marketing of oil produced from these areas.

Although the founding of the government company was admittedly influenced to some extent by emotional factors—official statements conceded that it was created partly in response to a long-standing national aspiration—three further reasons were adduced to justify its necessity. It was stated, firstly, that the corporation would be more beneficial financially to the country because all of the profits would accrue to the State instead of, say 69%. Secondly, the corporation would provide the government with a gage or standard of comparison through which to verify some of the contentions of the private companies. Thirdly, it would build up a body of technical personnel capable of running the industry after the present concessions expire.

The principal difficulties faced by the corporation are the familiar ones of lack of capital and lack of export outlets. The government is in an extremely tight situation for cash, and is understandably reluctant to allocate its meager resources to a project which, however necessary it might be considered for the long run, is not a pressing necessity right now. This, plus, perhaps, the lack of suitably qualified personnel, is responsible for the slow movement toward the materialization of anything more than a paper organization. The corporation has been authorized to undertake drilling and production in certain well-defined areas in the Lake and Eastern Venezuela, all of them contiguous to proved acreage, and has been allocated $1.5 million for the 1960-1961 fiscal year.

The second difficulty, the lack of export outlets, might present just as great a problem. The obvious temptation is to solve it by exerting pressure on the private oil companies to market the government corporation's production. However, in Cuba and India, the companies have demonstrated their determination not to place at the disposal of governments a link in their vertically integrated investments which they regard as an economically indivisible whole. To do so would break the chain of profit-making on the preceding links and make nonsense of the whole complex structure. It is true that the Venezuelan government might persuade the private companies to take a limited amount of oil in the case of unitized areas where both government and private companies have producing interests in common, but there is a limit which could soon be reached. Initially, the corporation will rely on outlets in the national market, but if it is to become a large producer (and refiner), it must sooner or later settle down to finding suitable outlets in the international market.

One field—conservation—in Venezuela's oil policy remains basically unchanged since the new government took over. Since well before the second World War, conservation has been a major concern of Venezuela's policy and is of course implicit in its aim to "sow the petroleum," that is, to diversify and industrialize while it can. However, even in this area, there has been a marked change in tone, and the Ministry has followed a stronger and more energetic line by insisting on the unitization of certain fields for secondary recovery purposes.

Not surprisingly, training of technical staff is still the most neglected aspect of the government's policy. The new Venezuelan Petroleum Corp. is supposed to play its role here as a training ground, and it doubtless will, but this tends to beg the question, since any sizable corporation must presuppose the availability of a certain number of already experienced people.

Training is the poor relation, pushed to one side because other things appear to be more pressing. And yet, if Venezuela's policy of taking an active hand in its own industry is to succeed, it must have a large body of technically qualified staff, which cannot be created overnight, or even within a decade.

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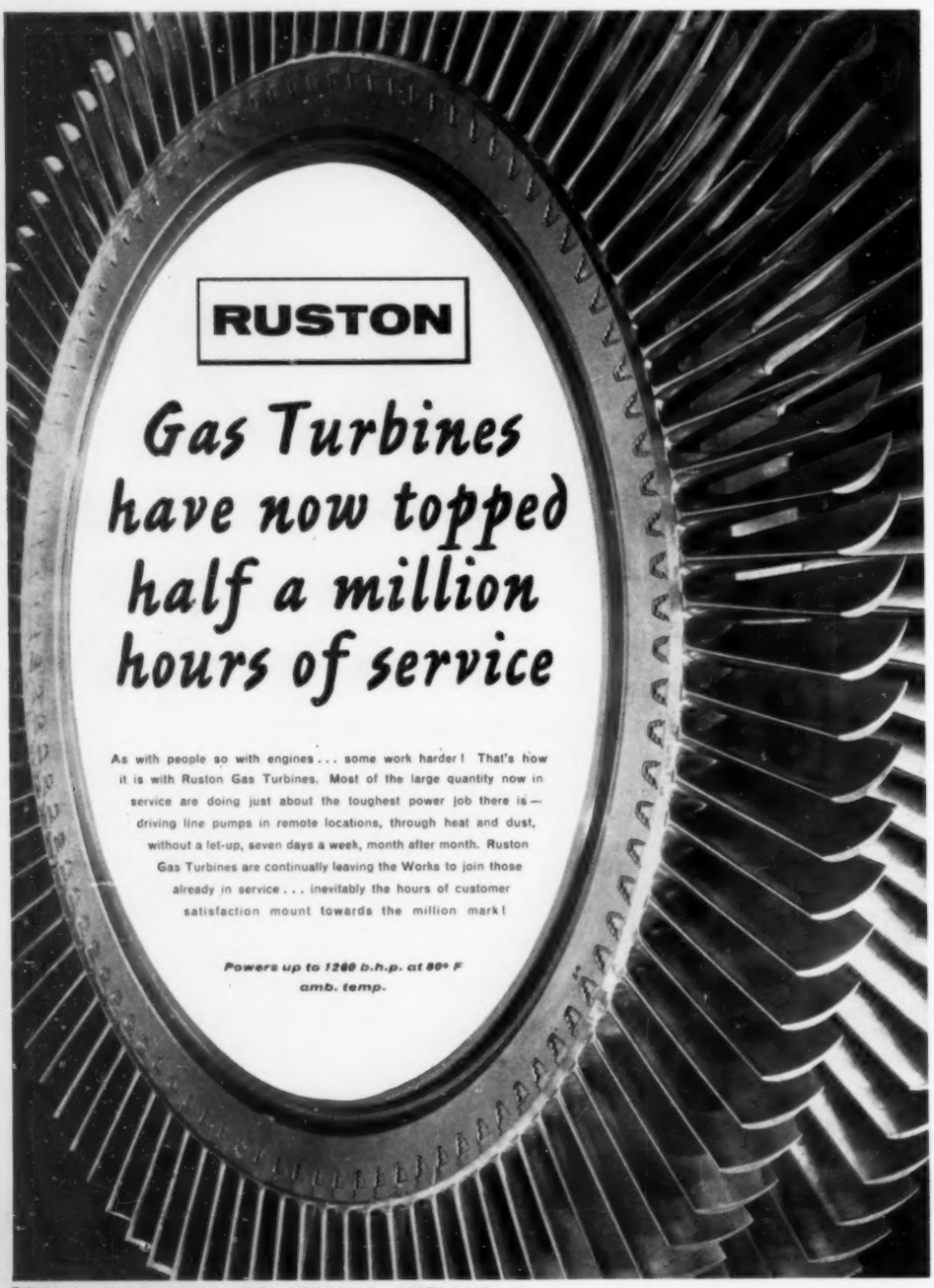
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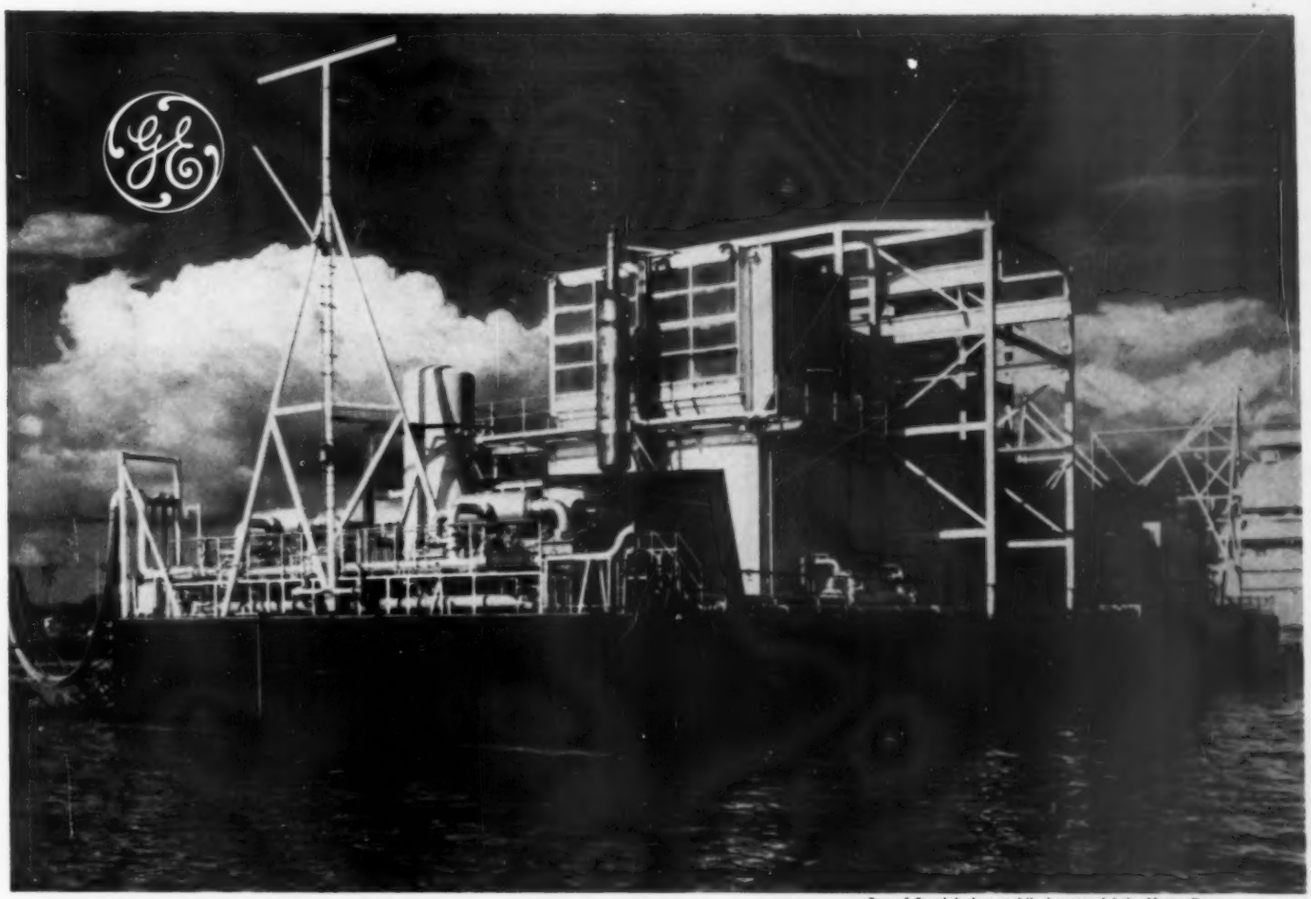


One of Creole's two mobile barges at Lake Maracaibo.

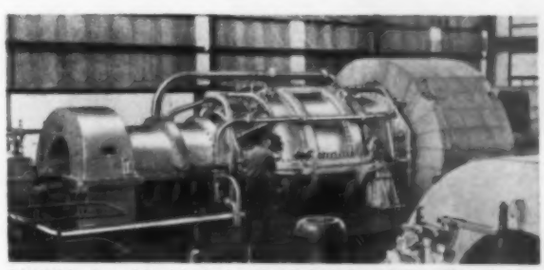
GENERAL ELECTRIC BUILDS "FLOATING POWER PLANTS" FOR CREOLE PETROLEUM CORP. AT LAKE MARACAIBO

Mobile Barges Can Supply Emergency Power At Various Points

Handling the power needs of electrified wells is a problem in any oil field. For Creole Petroleum Corp. at Lake Maracaibo, the task is even more difficult because all of the company's more than 2,000 wells are located on the lake.

Creole selected a unique power station—one that could provide normal power requirements to its field, be moved promptly in case of system emergencies, and which could cope with a major shift of electrical load during expanding operations.

Built by General Electric two floating power stations can be quickly towed from one location to another. Each contains the required oil and gas fuel handling equipment, step-up transformers, switchgear, control equipment, and an overhead dead-end structure for connecting the 34.5-kv output to shore. Each 15,000 kw gas turbine-driven generator, mounted on a steel barge 200 feet by 50 feet, can be started, stopped, and controlled from either aboard the barge or from a remote control point by supervisory control. These unique stations were delivered for less than it would have cost to expand existing land based facilities.



A 15,000 kw General Electric simple-cycle, single-shaft gas turbine, like unit shown above, provides power for one of Creole's "floating power stations" on Lake Maracaibo, Venezuela. G-E gas turbines are backed by over 4 million operating hours in a wide variety of applications.

The G-E gas turbines at Lake Maracaibo are the first units of this size to be installed aboard barges, and represent another example of how General Electric progress and development can help solve the most difficult power problems. For assistance with your own power program, contact your nearest G-E representative or write: *International General Electric Co., 22-10E, 150 East 42nd Street, New York 17, New York, U.S.A.*

GENERAL ELECTRIC

—U.S.A.—

(*Continued from page 88*)

It takes several years of university training plus several years of working experience. The scope of the effort required may not be generally realized: several hundred Venezuelan petroleum and chemical engineers are needed in a country where there is no surplus of children with sufficient education to enter a university.

The companies themselves, after fifteen post-war years of large-scale operations in Venezuela, have a disappointingly low proportion of Venezuelan graduates in their refining and producing departments. Unless an intensive effort is made in this direction, Venezuela will find itself fifteen years from now in essentially the same position as it was fifteen years ago and is today—that is, heavily dependent on U. S. and European technicians.

In spite of some strong words on both sides, the implementation of the new policies is being undertaken with caution and restraint (perhaps imposed, to some extent, by the lack of funds). The increase in taxes was bitterly resented by the industry, but it is well to reflect that no significant sector of Venezuelan opinion has gone on a rampage against, say the companies' refineries in the Netherlands Antilles, nor has anyone outside Communist groups seriously proposed nationalization of the industry. Policy has reflected these realistic attitudes, and has gone further, in encouraging responsible circles to think and talk about the country's petroleum industry.

Among other steps in this direction, a National Energy Council was created, composed of members of the Congress, government, and business circles, and has been asked to advise on specific problems with a view to forming adequate policies.

The changes in Venezuelan petroleum policy during the last three years toward higher taxes, government control of export prices, direct government participation in the oil industry, and a generally more energetic and control-bent attitude, have certainly cut sharp and deep. They have influenced, and will continue to influence, the governments of other oil-producing nations, and much of the form and kind of future of the international oil companies abroad will depend on the success or failure of these new policies. END

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Washington Pipeline

(*Continued from page 6*)

billion cubic feet of helium over the years. The act forbade Interior from signing any contracts until some months after the new President of the United States is elected and in office.

Interior said the government plans a pipeline gathering system in the Texas Panhandle-Hugoton area of Texas, Oklahoma and Kansas to carry the helium to the government-owned Cliffside field near Amarillo, Texas, for storage.

U.S. Oil Import Contracts Swapped

About 38% of crude oil products authorized to specific importers is turned over to others to import under exchange agreements, it is reported by the Oil Import Administration. A total of 371,322 b/d of crude oil imports is being exchanged for domestic crude by companies with import quotas. This is out of a total quota of 968,152 b/d.

The ratio is 40% for import to districts one through four, where 285,660 b/d of authorized imports are under exchange agreements out of total authorized imports of 704,316. The ratio is 32% for district five, where 85,662 b/d is under exchange agreemeents out of total quotas of 263,836.

Inland refiners and others with import quotas often find it wiser to exchange their quotas for varying amounts of domestic crude oil which is nearer to their plants. Exchanges are permitted, if the importer uses imports in his own plant, and no money changes hands.

Standard Oil Co. (Calif.) which picked up 72,283 b/d of crude oil imports by exchanges of domestic crude, is the leader in this field. Some 30,685 b/d is for import into district five and 31,598 b/d for import into districts one through four.

Tidewater Oil Co. picked up 37,627 b/d, 31,123 for districts one through four and 6,403 for district five. Socony Mobil Oil Co. picked up 37,010 b/d, 33,569 for districts one through four and 3,441 for district five. Gulf Oil Corp. picked up 32,994 b/d, 31,539 for districts one through four and 1,455 for district five. Atlantic Refining Co. picked up 31,859 b/d, all for districts one through four.

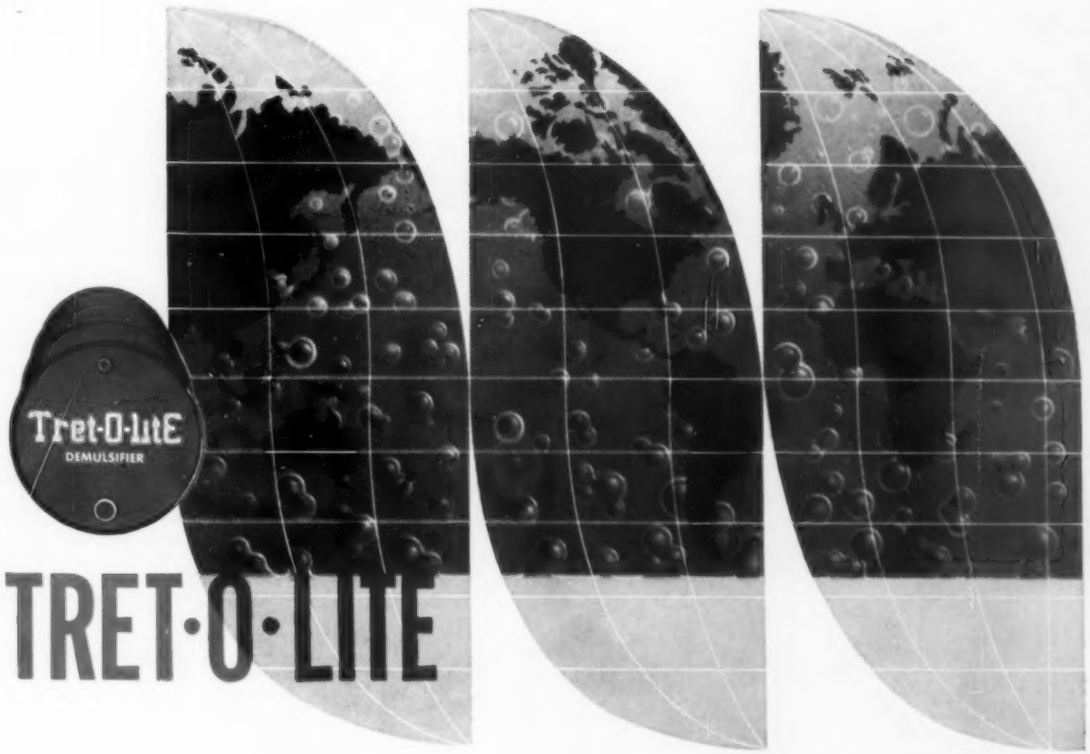
U.S. Oil Import Changes

Events of the past few months indicate clearly that if men can make rules about imports of crude oil and of oil products, they also can change them. Here's a rundown of some of the major changes, since the program was started March, 1959:

First, overland shipments of crude oil and of oil products, from the country of production of the oil, were exempted from the import control program. Effect of this was to allow in Canadian oil regardless of the import quotas.

Second, residual oil imports were allocated on the basis of three months instead of six, to allow more control over them to the government. One idea is to prevent importers using up their quotas too fast, and then crying for more quotas on the grounds of "emergency."

(*Continued on page 92*)



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NETHERLANDS, The Hague • **PERU**, Talara • **TRINIDAD**, Port of Spain

(Continued from page 90)

Third, officials proposed to change the residual import rules to allow some room for newcomers to import, if they had the facilities to do so. This change sprang, in part, from a court challenge by Gulf Oil Corp. to the allocation of residual import quotas.

Fourth, finally officials proposed to slash crude oil imports to districts one through four, all of the U.S. except the Western states, by about 58,000 b/d. The change would make up for an increase of 100% to 25,000 b/d, of crude and products moving from district five to the other districts, for an increase in residual imports in the past three years from 385,000 b/d to 490,000 b/d, and for errors in Bureau of Mines estimates of demand.

While the last two changes are proposals at this writing, there are clear signs that they have top level approval of U.S. officials.

There is little pattern in these major changes. Thus, the Canadian exemption tended to hurt U.S. oil producers, but the latest change tends to help them. The hurt from the Canadian exemption is lessened by the fact that many U.S. producers also are active in Canada.

The shift to three months for residual quotas came at the urging of coal forces, and the move to allow in additional imports comes to correct an obvious inequity in the program. All products, including residual, have been allowed to come in only by companies which were importing in 1957, and only in their ratio of the imports at that time. Thus, newcomers were effectively shut out, and growth factors by aggressive companies have been ignored.

Large Gas Stations Decline in U.S.

The very large volume gasoline station in the U.S. may be on the way out. At least, U.S. Census Bureau figures indicate this.

In 1954, Census figures showed the following: Two stations doing more than $5 million each a year in business; 19 stations with more than $2 million in sales; 61 stations with more than $1 million in sales.

By 1958, this had changed as follows: No stations doing as much as $5 million a year. No stations doing as much as $2 million a year; 14 stations doing more than $1 million in sales. Overall, gasoline stations handled more sales in 1958 than in 1954. The average sales per station rose from $58,013 to $68,967.

Mid East Production Up 11%

Middle East crude oil production, more than five million b/d, is up close to 11% over last year, although the gain was forecast at only 6%, according to W. E. Lindenmuth of Mobil International Oil Co.

One reason has been a steep rise in demand, he said. Thus, demand in Europe, the market for two-thirds of the Middle East oil, has been up 18 to 20%. In the Far East, market for one-fifth of the oil, demand has risen 17%, including a rise of 41% in Japan.

Middle Eastern governments have been talking of international proration, but the problems in such a scheme seem "insurmountable," he told a Quartermaster Association meeting in Washington, D. C. For it to work, "all the major exporting countries of the world must participate."

But an agreement between the Middle East and Venezuela alone could "exert a major influence on world supplies," he added.

Private U.S. Tankers Favored

Military Sea Transportation Service, which moves about 14.5 million barrels of crude oil and oil products a year, relies on private tankers for more than half of the hauling. When the barrels lifted and the mileage carried both are considered, private vessels represent about 70% of the business. MSTS has a definite policy of laying up its T-2 and other tankers "in order to provide employment for privately-owned tankers," it is explained by Rear Admiral J. L. Chew, deputy commander of the MSTS. Payments to commercial interests come to $77.8 million a year, about 97% of the total of $80.5 for MSTS tanker operations.

The coming of supertankers has made the job of MSTS more complicated, he explains. MSTS feels that tankers of 20,000 deadweight tons to 25,000 dwt with not more than 32-foot draft must be built for use for years to come. And even for these, U.S. and overseas ports, terminals and storage facilities must be enlarged. MSTS feels that some ports need less than a full cargo of even the 16,000-ton T-2 tanker, partly because needs are small, partly because bases live off the top of the tank to keep supplies up.

Craig Opens Washington Office

Lucien Craig, who was 25 years with Gulf Oil Corp., has opened an office for Craig Associates in the Landmark Building, 1343 H Street, NW, Washington 5, D.C. The office offers public affairs services.

Mr. Craig, who has been in the oil industry since 1916, and served in several liaison positions between industry and the government, spent his last six years with Gulf as the firm's Washington representative. He reached retirement age a year ago.

International Consulting Firm

Earle F. Taylor, Glen R. Neighbors and Stewart H. Folk have announced the formation of Taylor and Associates, Inc., a consulting firm with offices in Houston, Texas. These geologists and engineers with many years experience throughout the world, in petroleum exploration, development and evaluation, plan to specialize in consulting work in foreign countries and Alaska. They formerly worked exclusively for Tennessee Gas Transmission Co., Union Texas Natural Gas Corp., Lion Oil Co. and Murphy Corp. in an advisory capacity.

Ohio Buys Production

The Ohio Oil Co. has assumed ownership of all Kinney-Coastal Oil Co. properties for $1,629,000 cash plus an oil and gas production payment of $7,300,000. The latter payment is expected to cover a period of about seven years. Kinney-Coastal net production amounts to about 2,300 b/d, mostly from Garland Field in the Big Horn Basin of Wyoming where it holds a half interest. Ohio Oil, owning the other half, has operated the Kinney-Coastal properties in the field for the past thirty years. The Garland Field represents approximately 80% of the acquisition.

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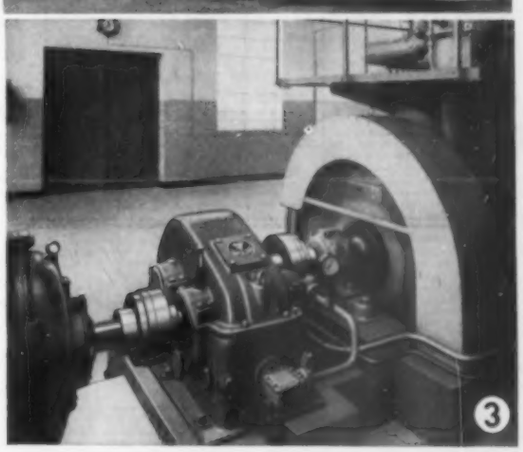

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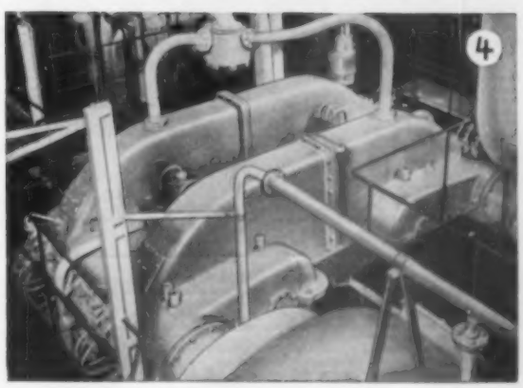

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World Petroleum Statistics

FREE WORLD SUPPLY AND DEMAND, CRUDE AND PRODUCTS, MARCH 1960

Thousands of barrels)

Source: USA Bureau of Mines, Division of Petroleum.

Country	CRUDE PETROLEUM: Production	Imports	Exports and reexports	Stock change, other demand, and loss	Total 1/ refinery input / Total 2/ refinery output	REFINED PRODUCTS: Imports	Exports and reexports	Domestic demand (incl. bunkers) 3/	Bunkers-all flags (as reported)
NORTH AMERICA									
Canada	17,937	11,124	3,401	+2,250	23,290	1,160	124	4/28,299	
Mexico	8,576	-	-	+48	9,047	608	600	9,055	
United States (incl. Alaska and Hawaii)	220,277	29,292	260	+4,586	258,770	29,966	6,302	4/338,184	6,724
Subtotal	246,790	40,416	3,661	+6,884	291,097	31,734	7,026	375,538	
CENTRAL AMERICA AND CARIBBEAN									
Costa Rica	-	-	-	-	-	E/ 98	-	98	
Cuba	16	E/2,000	-	-163	2,179	E/ 366	-	2,545	
Dominican Republic	-	-	-	-	-	E/ 217	-	217	
El Salvador	-	-	-	-	-	E/ 144	-	144	
Guatemala	-	-	-	-	-	E/ 274	-	274	
Haiti	-	-	-	-	-	E/ 72	-	72	
Jamaica	-	-	-	-	-	487	-	487	E/ 68
Nicaragua	-	-	-	-	-	E/ 127	-	127	
Panama, Canal Zone	-	-	-	-	-	363	172	791	547
Panama, Republic	-	-	-	-	-	E/ 265	-	265	
Puerto Rico	-	1,860	-	+342	1,707	375	735	1,347	
Subtotal	16	3,860	-	+179	3,886	3,388	907	6,367	
SOUTH AMERICA									
Argentina	4,311	2,204	-	-758	7,273	432	1	4/7,610	116
Bolivia	246	-	72	-2	178	11	4	185	
Brazil	2,364	2,197	968	-1,183	4,776	E/4,679	E/ 25	4/9,455	
Chile	589	457	-	+233	813	E/809	-	1,422	
Colombia	4,846	-	2,604	+100	2,261	E/ 29	598	4/1,042	E/115
Ecuador	228	-	-	-44	272	17	-	289	
Netherlands Antilles	-	20,934	-	+835	20,932	E/1,521	E/20,137	2/2,316	
Paraguay	-	-	-	-	-	E/ 61	-	61	
Peru	1,582	-	191	+27	1,301	475	129	1,727	31
Trinidad	3,702	2,068	307	+601	5,900	E/285	E/4,763	5/1,422	1,184
Uruguay	-	1,009	-	+208	801	63	-	864	E/ 78
Venezuela	85,739	-	58,627	+18	27,285	E/ 71	26,743	4/2,280	1,591
Subtotal	103,602	28,869	62,769	-967	71,872	8,253	46,450	31,973	
WESTERN EUROPE									
Austria	1,438	425	588	+96	1,251	737	202	4/1,586	
Belgium and Luxembourg	-	4,884	-	+500	4,434	2,533	1,624	5,341	350
Denmark	-	38	-	+21	E/ 17	3,591	9	3,599	127
Finland	-	216	-	-434	E/650	1,013	-	1,863	
France	1,133	19,086	-	+425	19,809	1,555	4,214	3/16,698	765
Germany, West	3,326	13,314	-	+1,343	15,297	6,417	1,068	20,644	339
Greece	-	1,093	-	+130	763	420	-	1,183	
Iceland	-	-	-	-	-	164	-	164	
Ireland	-	1,351	-	+245	1,106	398	-	1,494	46
Italy	996	20,256	172	+2,288	19,502	1,260	5,007	3/12,491	1,177
Netherlands	1,066	12,212	43	+4,180	10,296	4,311	6,584	8,023	707
Norway	-	63	-	-7	E/ 70	2,141	-	2,211	E/175
Portugal	-	450	-	-242	692	269	85	876	
Spain	-	3,071	-	+427	2,715	84	104	2,695	E/154
Sweden	-	897	-	-746	1,603	4,065	48	5,520	E/247
Switzerland	-	-	-	-	-	2,067	8	2,059	
United Kingdom	55	25,296	-	-759	26,110	11,472	5,817	4/30,340	2,555
Yugoslavia	362	415	-	-25	802	E/ 88	E/ 32	658	
Subtotal	8,376	101,027	805	+7,042	105,117	42,573	24,902	117,549	
MIDDLE EAST									
Aden	-	-	-	-31	31	1,991	52	5/1,970	2,062
Bahrain	1,399	4,717	-	+107	6,010	-	5,900	5/1,016	385
Iran	33,415	-	20,921	-515	E/13,009	-	8,511	4,498	E/540
Iraq	29,162	-	27,316	+595	E/1,251	E/ 1	-	1,252	
Israel	77	E/843	-	-	920	E/898	-	1,818	E/ 31
Jordan	-	-	-	-	-	E/ 96	-	96	
Kuwait	49,605	-	42,435	+1,280	5,890	-	3,369	5/2,521	2,103
Lebanon	-	469	-	-	469	E/ 28	-	497	E/ 67
Neutral Zone	3,969	-	E/3,000	+69	E/900	-	E/390	5/510	E/300
Qatar	5,581	-	E/5,563	-	E/ 18	-	-	18	
Saudi Arabia	36,435	-	28,988	+1,254	6,193	1	4,514	1,680	E/1,060
Turkey	227	-	-	+11	216	1,001	-	1,217	
U.A.R., Syria	-	E/457	-	-	E/457	22	-	479	
Subtotal	159,870	6,486	128,223	+2,770	35,364	4,040	22,756	17,572	
AFRICA									
Algeria	3,960	-	3,737	+223	-	763	-	4/742	
Angola	35	19	-	+11	43	56	-	99	6
Belgian Congo	-	-	-	-	-	296	-	296	
Canary Islands	-	1,935	-	-87	2,524	3	1,233	5/1,288	501
Ethiopia	-	-	-	-	-	E/ 57	-	57	
States formerly in French Equatorial Africa	491	-	529	-38	-	E/178	-	178	
French West Africa	-	-	-	-	-	E/341	-	341	E/660
Ghana	-	-	-	-	-	357	-	357	
Kenya	-	-	-	-	-	500	77	423	E/ 76
Liberia	-	-	-	-	-	E/ 32	-	32	E/ 3
Madagascar	-	-	-	-	-	66	-	66	
Morocco	64	-	-	+9	55	330	-	4/453	E/ 42
Nigeria	-	-	-	-	-	524	-	524	
Rhodesia & Nyasaland	-	-	-	-	-	E/331	-	331	
Sudan	-	-	-	-	-	267	-	267	
Tanganyika	-	-	-	-	-	44	32	12	
Tunisia	-	-	-	-	-	197	-	5/282	
Uganda	-	-	-	-	-	116	16	100	
Union of South Africa	-	416	-	+39	377	1,253	284	1,346	
U.A.R., Egypt	1,835	E/1,000	433	-98	E/2,500	E/596	E/123	2,973	E/185
Subtotal	6,385	3,370	4,699	-59	5,499	6,307	1,771	10,167	
SOUTH ASIA, FAR EAST, AND OCEANIA									
Australia	-	6,566	-	-142	6,708	851	1,372	6,187	E/632
British Borneo	E/3,140	-	1,621	-	E/1,519	E/ 77	E/1,213	383	98
Burma	384	-	-	+49	335	E/ 9	3	341	
Ceylon	-	-	-	-	-	457	-	457	218
India	264	5,597	-	+1,916	E/3,945	1,855	192	5,608	E/230
Indonesia	12,652	E/749	6,750	-339	E/7,580	E/271	E/8,190	2,571	E/ 87
Japan	279	20,040	-	+2,904	17,903	3,659	308	21,254	
Korea, South	-	-	-	-	-	E/434	-	434	
Malaya and Singapore	-	169	143	+26	-	2,999	1,424	1,575	1,070
Netherlands New Guinea	130	-	E/130	-	-	-	-	Insig.	
New Caledonia	-	-	-	-	-	E/ 34	-	34	
New Zealand	-	-	-	-	-	841	-	841	E/150
Pakistan	183	-	-	-	E/183	E/669	-	852	E/ 11
Philippines	-	913	-	+110	803	E/859	-	1,662	
Taiwan	1	693	-	+107	587	-	6	530	
Thailand	-	-	-	-	-	758	-	758	28
Vietnam, South (incl. Cambodia)	-	-	-	-	-	E/461	-	461	E/ 3
Subtotal	17,033	34,727	8,644	+4,631	39,563	14,243	12,708	44,008	
WORLD TOTAL EXCLUDING EASTERN EUROPE, U.S.S.R., & MAINLAND CHINA	542,022	220,755	208,801	+21,198	552,398	110,538	116,420	602,474	

E/ Estimate based on latest available data.
1/ Total input includes crude runs to stills plus runs of other unfinished oils, topped crude and natural gas liquids blended.
2/ Total output includes refined product output plus refinery fuel and loss; excludes liquefied petroleum gases sold directly for fuel and chemical uses from natural gasoline plants.
3/ Unless otherwise specified, data represent apparent domestic demand (including inland demand, refinery fuel and loss, and bunkers). Apparent domestic demand is derived from the components of refined product output, plus imports, minus exports, with no allowance for changes in stocks.
4/ Domestic demand as reported, including refinery fuel and loss, stock changes, and bunkers; also includes, where available, liquefied petroleum gases sold directly for fuel and chemical uses from natural gasoline plants.
5/ Apparent domestic demand is heavily influenced by refinery fuel and loss, and bunker loadings.

Nine Month Earnings Are Up

The total earnings of 42 oil companies rose by 4.6% in the first nine months of 1960, to $2.273 million. For the first nine months of 1959, these companies had reported a net profit totalling $2.175 million.

Third quarter earnings contributed substantially to the improved profits picture, having increased some 12% this year compared with the same period in 1959.

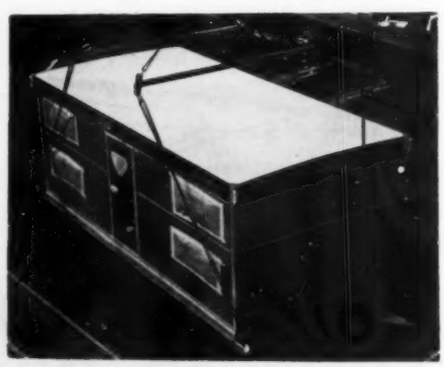
Among the USA international companies: Socony Mobil nine-month earnings were up $12.9 million (10.4%); Gulf was up $21.4 million (9.8%); Texaco up $17.1 million (6.6%); Standard of California up $19.1 million (10.6%); and Standard of New Jersey up $24 million (5%).

Percentage increases for some of the larger but predominantly domestic USA companies were generally mixed. Atlantic increased $2.5 million (10%); Standard of Indiana was down $3.4 million (3.2%); Sinclair remained unchanged; Sun Oil was up $2.7 million (8.4%); Sunray Mid-Continent down $1.7 million (5.5%); and Union of California up $3.8 million (19%).

OIL COMPANY EARNINGS, NINE MONTHS

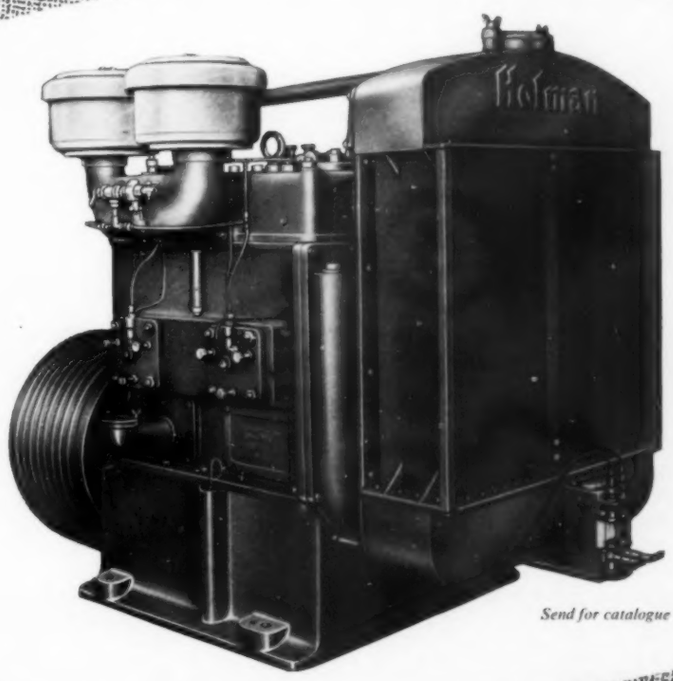
	1959 Nine Months	1959 Per Share	1960 Nine Months	1960 Per Share
Ambassador Oil	378	$0.10	964	$0.26
Amerada Petroleum	17,563	2.78	18,018	2.85
Anderson-Prichard	4,867	2.75	3,863	2.03
Atlantic Refining	25,429	2.70	27,405	2.92
Barber Oil	(808)[1]	—	(628)[1]	--
Champlin Oil & Refg.	6,144	1.43	6,148	1.44
Cities Service	27,301	2.54	26,539	2.47
Colorado Oil & Gas	1,765	0.43	638	0.08
Commonwealth Oil Refg.	901	0.22	3,667	0.74
Continental Oil	45,330	2.15	45,435	2.15
Creole Petroleum	153,297	1.97	153,590	1.98
Delhi-Taylor Oil	2,700	0.52	3,050	0.59
Douglas Oil	522	0.52	597	0.47
Getty Oil	9,931	0.72	7,680	0.48
Gulf Oil Corp.	216,475	2.10	237,910	2.31
Imperial Oil Ltd.	37,682	1.20	46,700	1.48
Ohio Oil Co.	27,323	1.95	27,410	1.98
Phillips Petroleum	77,386	2.25	78,920	2.30
Pure Oil	19,242	2.21	20,213	2.04
Quaker State	1,763	2.14	1,361	1.65
Richfield Oil	18,189	4.51	20,776	5.14
Royalite Oil	356	0.07	780	0.21
Shell Oil Co.	104,055	1.72	104,308	1.72
Signal Oil & Gas	12,525	1.32	11,960	1.26
Sinclair Oil Corp.	34,571	2.25	34,504	2.24
Sinclair Venezuelan	7,091	1.77	10,122	2.53
Skelly Oil	19,110	3.33	17,122	3.02
Socony Mobil Oil	123,000	2.54	135,900	2.82
Standard of California	180,115	2.85	199,255	3.15
Standard of Indiana	106,189	2.97	102,826	2.87
Standard of Kentucky	11,183	4.29	10,448	4.01
Standard Oil (N. J.)	477,000	2.22	501,000	2.31
Standard of Ohio	17,959[2]	3.59	17,574	3.51
Sun Oil Co.	32,151	2.74	34,852	2.83
Sunray Mid-Continent	30,783	?	29,078	1.48
Texaco, Inc.	261,854	4.41	278,984	4.61
Texaco Canada Ltd.	7,499	2.28	8,567	2.61
Texas Pacific C. & O.	5,183	1.33	5,759	1.48
Tidewater Oil	27,832	1.76	31,351	2.01
Union Oil of Calif.	19,900	2.33	23,700	2.78
Universal Cons. Oil	2,416	2.52	1,880	1.98
Wilcox Oil	668	2.14	579	1.80
	2,174,850		2,273,143	

[1] Figures in parentheses are deficits.
[2] Includes non-recurring profit of $3,409,000.



Thirty-six insulated buildings—an entire village—have been shipped out of the Port of Houston by orders for Porta-Kamp Manufacturing Co., Inc. The buildings were bound for the Libyan desert, scene of operations of a major oil company. Shown is one of the 36 units being crane-hoisted. The buildings are constructed on steel skids of wood framing and aluminum exteriors.

Extended life at diminished cost



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Holman T 60 R Stationary Air Compressor

When a constant supply of cooling water is not available or the outflow is difficult to dispose of—the HOLMAN T 60 R air compressor is ideal, because of its pressurised closed circuit water cooling system. It is also ideal for 'In-Bye' installation. Maximum continuous air pressure 150 lb./sq. in. F.A.D. 525 cu. ft./min. at 100 lb./sq. in.

All other outstanding features of the T 60 R are common to the comprehensive range of HOLMAN stationary air compressors. Namely, two-stage compression using differential pistons, efficient intercooling and low discharge temperature, maximum cooling of cylinders and valves. Automatic disc inlet valves of HOLMAN design have an important role in the really superior efficiency of these compressors. Large bearing areas and minimised vibration guarantee maximum working life through reduced stresses. Detailed efficiencies and the overall efficiency of HOLMAN stationary compressors provide more cubic feet of air delivered per unit of power input than any other machines of comparative sizes.

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Automatic Fuel Washing Unit

(Continued from page 76)

The centrifuge is a self-cleaning type unit provided with internal water reflux to permit passage of solid sludge and dirt particles from the peripheral nozzles while maintaining the oil-water interface within the machine. The position of the interface is controlled either by interchangeable dams which are switched when fuel varies by more than one or two degrees API or by adjusting the temperature of the recycle water.

Beside removal of water soluble salts, some sludge particles are also ejected from the nozzles. It is believed this leads to improvements in combustion due to reduced firebrick damage from flame impingement.

The oil preheater and cooler were mounted above the existing fuel heaters, between the starboard boiler and the hull of the SEAMAN. The charge pump to the system and the demulsifier tank and pump are in the forward end of the engine room next to the port wing using fuel tank.

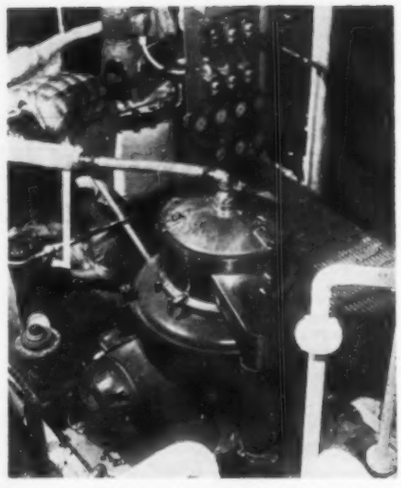
The equipment is designed to process up to 20 gpm of bunker fuel of any gravity above 11.5 API (or lighter than 0.99 sp gr at 60°F). This limitation is required to maintain a minimum gravity differential which will permit centrifugal separation.

In similar installations on gas turbine units, this gravity limitation is overcome by weighting the water with a beneficial salt such as magnesium sulfate. This allows the use of virtually any gravity fuel and at the same time, traces of salt left in the fuel after washing contribute to the inhibition of vanadium corrosion on hot metal surfaces in the turbine. This was not regarded as justified for the system on the SEAMAN.

Because the washing system operates continuously, the bunkers normally are completely run through a day or two before the end of a typical ten-day voyage. This allows extra time for whatever cleaning or preparation may occasionally be needed. Experience from the year of operation has indicated operating difficulties to be minimal. Only occasional labor is required to remove sludge deposits from the recycle tank or to clean the centrifuge bowl when the unit is shut down.

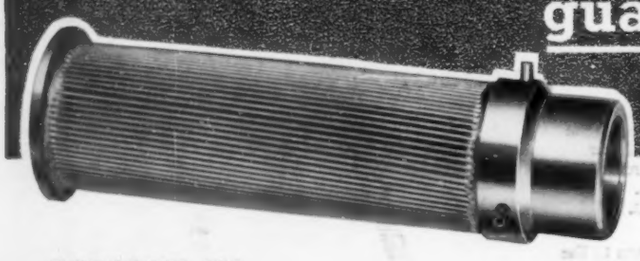
Washed oil water content is determined periodically to check on the separation in the centrifuge. This test has been found sufficient to guarantee that sodium removal is kept at about 65 to 70%, which reduces the sodium content of the fuel to the desired 20 ppm.

Occasional batches of fuel of a more naphthenic and acidic nature are more difficult to handle in the centrifuge. In such cases the water content of the washed oil rises, and it must be corrected by adjusting the interface in the centrifuge and/or increasing the dosage of the demulsifier. END



Centrifuge, which is heart of the bunker fuel oil purification system.

Vokes new filter media with guaranteed 100% efficiency



POROLOY CM.

Vokes now introduce a new all metal filter medium of outstanding efficiency for the *controlled* filtration of hydraulic and lubricating oils, fuels, air, gases, acids, caustics and related caustic materials, chemicals and solvents at extreme temperatures and pressures. Poroloy CM filter elements can be made in any size or shape from a variety of metals—Stainless Steel, Inconel, Nickel, Copper, Steel and Nichrome being the most popular—features which, combined with special production techniques to give controlled pore configuration, enable filters to be individually designed for special applications. Metals can be selected with the particular requirements of the application in mind and the size of the pores can be controlled to deal with particles of between 2 and 250 microns. Poroloy CM filters are therefore 100% effective against a stated particle size, *the danger of media migration being eliminated by an accurately controlled sintering process.* The ultimate tensile strength of the elements varies from 2,000 to 60,000 p.s.i. and the operating temperature range is from —400°F to 1200°F.

The unique combination of properties found in Poroloy CM has led to its recent use in critical temperature conditions in the United States missile and aircraft industries, including installation in the Boeing 707.

POROLOY T.

Similar in performance to Poroloy CM but manufactured by a different process, Poroloy T has an operating temperature range from —400°F to 1500°F. Pore size ratings are from 2 to 250 microns and tensile strength varies from 2,000 to 100,000 p.s.i.

This illustration shows the many sizes and forms—seamless tubes, flat discs, corrugated elements etc.—in which Poroloy can be manufactured.

Both filter elements are manufactured in conditions of micro-cleanliness and before despatch are individually checked for performance in bubble point testing equipment.

Poroloy was developed by the California Institute of Technology and is manufactured in the U.K. under license from The Bendix Corporation, U.S.A.

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In addition, some 2000 technicians from the Werkspoor Construction Department are engaged in the erection of complete factories and installations, not only in the Botlek Area, but all over the world.

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INTERNATIONAL NEWS AND NOTES

ALASKA—Standard Oil Co. of California, (SOCAL) Western Operations, Inc. has announced Richfield Oil Corp. has acquired a 50% interest in the $5,000,000 22-mile pipeline and terminal from Soldotna on Alaska's Kenai Peninsula south of Anchorage to Cook Inlet which the Kenai Pipeline Co., a subsidiary of Standard is just completing. Oil produced in the Swanson River and Soldotna Creek Areas from properties held jointly by Richfield and Standard and other companies will be shipped through the pipeline to terminal facilities at Cook Inlet for loading into tankers. The first tanker will be loaded early in November.

ALGERIA—Compagnie d'Exploration Petroliere is studying a crude oil pipe line of 100 kilometers of eight or 10 inch from the new Ohanet field to In Amenas. In Amenas is the starting point of the existing Edjeleh-Tunisian pipe line operated by Compagnie de Transport par Pipeline au Sahara. The crude would go to La Skhirra on the Tunisian coast to tankers. The line would carry 1.5 million tons, an output CEP feels could be achieved by drilling 25 wells, a goal for October, 1961. If the field developed, it would become the first in the French Sahara in which an American company has an interest. Mobil Sahara has a 25% interest in the permit area, which CEP operates.

AUSTRALIA—Government oil-price officials believe lower overseas crude prices and cheaper tanker rates are bound eventually to be reflected in lowered Australian oil prices, which should go down as soon as present product stocks have been sold. Australian oil-industry authorities look for gasoline prices to be reduced 2¢ per gal on January 1, 1961. Present price for regular brands is 42¢ per gal, and 45¢ for premium-grade.

AUSTRALIA—New Australian seaport oil terminals to be built in New South Wales includes (1) a $250,000 depot by Total Oil Co., in five stages over five years, near Newcastle, where service stations also are to be erected; (2) a $600,000 depot by H. C. Sleigh Ltd. at Trial Bay near Southwest Rocks, 25 miles from Kempsey. With construction started, completion is due by mid-1961. Storage capacity is 3.5 million gallons for a full range of products; and tankers will discharge cargo into an underwater pipeline from the bay to tanks onshore. (Last June, Shell announced plans for a $600,000 terminal at Southwest Rocks.)

AUSTRALIA—Doubts about the continuity of gas supplies in the Roma area were "unjustified" despite previous cutouts, Associated Freney, Associated Australian Oilfields, and Papuan Apinaipi said in a half-yearly report to shareholders. The companies believe there are large calculated reserves. Basis of assessment of ore reserves is maintenance of supplies for periods of more than 20 years for which the companies aim to make long-term contracts.

It is estimated the capital cost of a pipeline from the Roma field to Brisbane, together with scrubbers and compressors, would be between $8 and $25 million.

AUSTRALIA—The Australian government has announced oil search subsidies of $705,282 to five companies—including Phillips Petroleum Co., which is to make an aeromagnetic survey in Queensland.

BRAZIL—Well completions in 1959 were 229 (940,372 feet) against 140 wells in 1958, it is reported. Some 137 wells (447,338 feet) were in proven fields, and 92 wells (493,034 feet) were exploratory. Some 122 of the wells in proven fields found oil and 15 were dry. Six of the exploratory wells found oil and 86 were dry.

CHINA (COMMUNIST)—Red China's minister of geology reports that Hungarian geologists have discovered "several promising" oil deposits in various parts of China, where Hungarian geologists have been working since 1956.

DENMARK—German Deutsche Erdol Gesellschaft has applied to the government for a concession to drill in southern Jutland. Others, too, have applied, it is reported. Danish American Prospecting Co., which was set up by Gulf in 1938 but sold to Standard Oil, came to the end of its concession last July, but had given up its efforts before then.

FRANCE—Crude production in all French oil fields is expected by French officials to rise to between 11.5 and 12 million tons (230,000 to 240,000 b/d) in 1960 from 3.9 million tons (78,000 b/d) in 1959, and to between 20 and 22 million tons (400,000 to 440,000 b/d) by 1962. Output in 1960 is foreseen as about seven million tons from Hassi-Messaoud area, up from nearly 1,379,600 tons during 1959; two million tons from Edjele, up from very little during 1959; two million tons from metropolitan France, up from 1,622,500 tons in 1959; 800,000 tons from the Gabon and 50,000 tons from the Congo, against 755,000 tons for both during 1959.

GERMANY (WEST)—Domestic consumption of petroleum products in West Germany increased 32% in the first six months of 1960 to 14,137,197 tons. Bunker oil sales at German ports also increased by 32% in the same period to 1,140,880 tons. Synthetic oil and shale oil sales totaled 219,669 tons, a drop of 8.4% from last year.

Largest rate of increase was in fuel oil. Light fuel sales rose 73.6%; heavy fuel oil 35.3%. The seasonal pattern is changing with more fuel being sold in winter months. Lube sales rose 11.1% in the half year, diesel fuel 8.8% and motor gasoline 16.2%.

INDIA—A six-man team of Russians from the Caspian Sea area is due for early arrival in India to conduct a geomagnetic survey of the Gulf of Cambay, according to India's Oil & Natural Gas Commission. Experimental drilling may follow. Action follows the mid-July visit of a Russian submarine driller, and marks a change because ONGC officials previously had asserted drilling in the gulf waters was too costly.

A. Entezam (second from right), chairman of the board and general managing director of the National Iranian Oil Co. in Tehran, Iran, with top executives of Pan American Petroleum Corp. He has concluded a tour of installations of affiliate companies of Standard Oil Co. (Indiana). Amir A. Hoveyda (left), a director of NIOC, accompanied Mr. Entezam on his U.S. trip. Shown with them are E. F. Bullard (second from left), Pan Am board chairman, and A. L. Solliday (right) company president. NIOC and Pan Am's subsidiary, Pan American International Oil Corp., are presently conducting a joint exploration venture in Iranian waters of the Persian Gulf.

INDIA—A Russian tanker arrived in Bombay in mid-August with 11,000 tons of high-speed diesel oil to start the flow of an agreed purchase by India of 1.5 million tons of products over three years from the Soviet. Payment is to be in rupees. Though actual prices have not been announced, speculation runs from 10% to 20% below prevailing prices for non-Soviet products.

INDIA—Well No. 9 in the Cambay region of India's west coast recently had oil shows. With this, eight of the nine wells in Cambay indicate oil possibilities.

INDIA—Concern over oil affairs in India is expressed by (1) mines and oil minister Malaviya, who warns oil companies to reduce their oil prices further or their future will not be bright (companies already have made price reductions of 12½% in the face of Soviet competition); (2) Malaviya's report that Cambay well No. 1 will start to produce oil in mid-1961, and that the government will start plans by the end of this year for a medium-sized public-sector refinery in Gujerat state to refine Cambay and Ankaleshwar crude; (3) expressed concern by legislators at the delay in exploitation of Nahorkatiya reserves in Assam; and who also urge more refining capacity and are irked that Free World refineries refuse to refine Russian crude.

INDIA—Among oil targets set at the recent four-day seminar of India's Oil & Gas Commission in Cambay, attended by Russians and Romanians, were: (1) drilling of 20 test wells in Cambay and a dozen in Ankaleshwar by the end of March 1961, and the ordering of 30 drilling rigs therefor; (2) immediate drilling in the western parts of Rajasthan and other parts of the Cambay basin; (3) reduction to total 5% of foreign drilling personnel by 1962; (4) erection of central research laboratories, and drilling repair and maintenance shops.

INDIA—Reports from Cambay indicate well No. 15, at 1,760 meters (6,000 ft) penetrated a pressurized hot-water belt, creating a sort of geyser; steps are being taken to seal it. Probably the Romanians would like to do the sealing, as it is one of their rigs which is assisting the drilling.

INDIA—India's expanded program for oil and gas during its third five-year plan (1961-66) includes appointment of an additional member to the commission. The draft plan provides $240 million dollars (or £86.25 million) for oil exploration—with promise of more if needed.

INDIA—Burmah-Shell Refineries, Ltd., estimates Indian oil consumption at 7.5 million tons in 1960 and 13.4 million tons by 1966. Existing refining capacity is put at 6 million tons, and two proposed public sector plants would add 2.75 million tons. To close the gap by 1966 would cost $126 million U. S. Burmah-Shell wants to increase its refining capacity from 2.6 million tons to 4 million and to set up a lubricating oil plant of 100,000 tons capacity.

ITALY—A London dispatch says Italy will buy 12 million tons of Soviet oil within the next four years in exchange for Italian steel tubing and synthetic rubber, according to the Russian agency Tass.

ITALY—New pricing and producing formulas must be adopted which will assure producing nations that their revenue from oil activity will not be diminished, said Enrico Mattei recently, referring to recent reductions in the prices posted for Middle East crude. (Mattei is head of ENI Italian State oil agency). Diego Guicciardi, head of Shell Italian, immediately countered that any cutbacks in oil-company profitability (which, the latter said, averaged 5.5% in 1959 for Europe's four largest oil firms) could result in the oil industry's inability to come up with vast amounts of needed capital. Even were the oil industry to hold its capital outlays the next four years to simply replacing and maintaining current essential facilities, an estimated $55 to $60 billion would be required.

(*Continued on page* 100)

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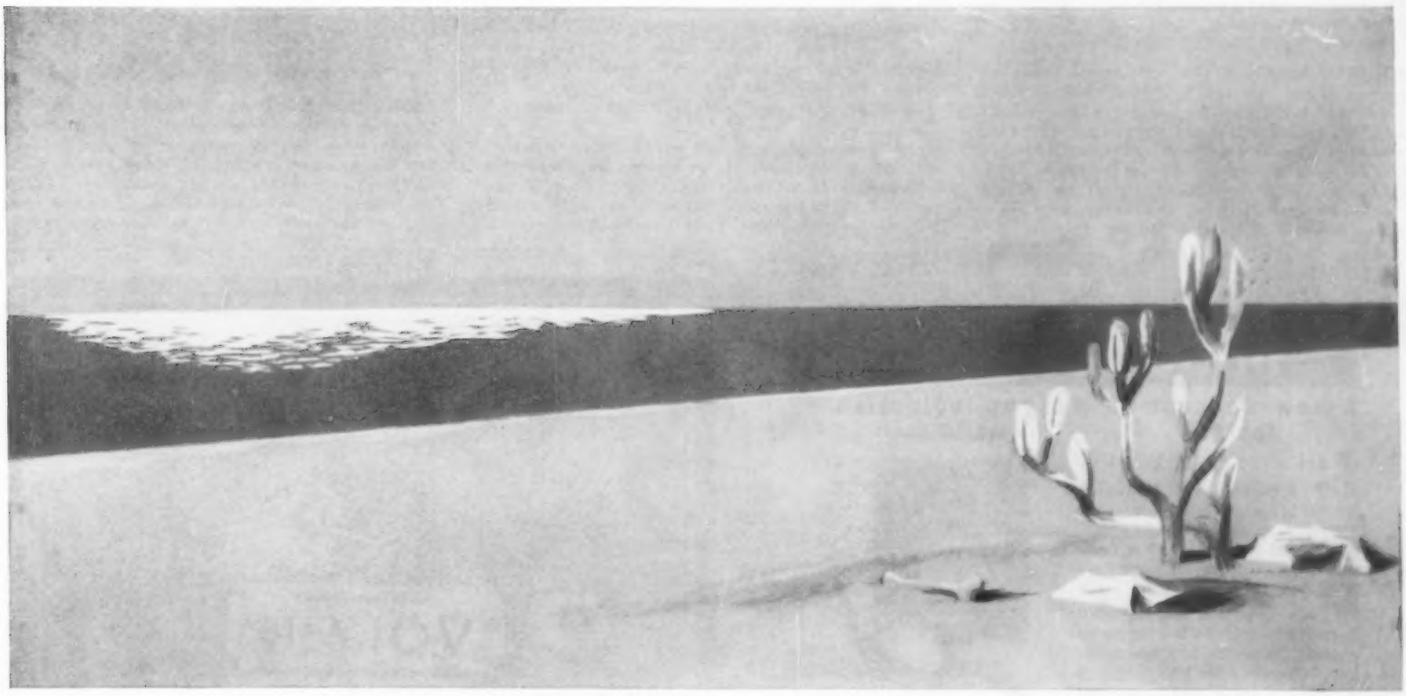
Sun-baked desert, parched and waterless—not a very promising site for a town. But, with the development of the Richardsons Westgarth multi-stage vacuum flash sea-water evaporator, it is now economically feasible for towns in arid coastal countries to draw all their fresh water from the sea.

These evaporators were pioneered in Great Britain by Richardsons Westgarth. The largest of them could distill 2,000,000 gallons of sea-water a day—enough for a town of 250,000 inhabitants—and the distillate is purer than many mains water supplies from conventional sources.

Richardsons Westgarth evaporators are at work in South America, the Middle East and elsewhere, providing fresh water for both domestic and industrial applications.

These units are at their most economical when used in conjunction with low-pressure steam or back-pressure turbines and, as manufacturers of most of the major equipment for power generation, Richardsons Westgarth are particularly well qualified to carry out completely integrated schemes.



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International News and Notes

(Continued from page 98)

JAPAN—Idemitsu Kosan, which has been obtaining cheap Soviet crude, is expected to ask the USSR shortly for a price cut. Understanding is Soviets will comply, because the contract for purchase of Russian crude is understood to have contained a sliding clause for meeting a slash in western oil prices.

LIBYA—Superior Oil Co. has incorporated in the USA two subsidiaries preparing for entry into oil operations in the Eastern Hemisphere. If the Libyan government qualifies the company, Superior expects to begin either as operator on existing rights or on new rights to be acquired in Libya—though which of the two the company has not disclosed. In Pakistan, Superior will be minority partner in an exploration venture as soon as the Pakistan government qualifies the company. Despite Superior's difficulties outside the USA and Canada where the company has operated to date), Superior will be moving into other countries in the future—"any place where we feel we can find oil," according to Superior's president Keck.

MEXICO—Second important step in the $225 million pipeline building project involving Pemex (Mexican government oil agency), Tennessee Gas Transmission, and Southern California Edison was the signing by Tennessee Gas of an agreement to deliver to Southern California Edison up to 455 mmcf per day of gas over a 10-year period beginning in 1962. Pemex will own and operate the 1,200-mile portion of the line running on Mexican soil.

PAPUA—Oil drilling at Lehi in Papua has been temporarily closed because of bad weather and the grounding of supply helicopters awaiting new rotor blades from the USA. When drilling stopped, the well had been deepened from 1,018 ft to 2,432 ft, and was in cretaceous mud stones. The Trans Hegigio survey has been completed, and the results are now being examined.

POLAND—Starting in 1965, the Soviet Union will increase its gas deliveries to Poland by 35.31 billion cubic feet yearly. For this purpose a new pipeline, for which Poland will supply the piping, will be laid from West Ukrainian gas fields to Przemysl (Poland). The gas will be used for the production of yearly 500,000 tons of nitric fertilizer, 15,000 tons of basic material for synthetic fibers, and enough acetylene to process it into 80,000 tons of plastics.

QATAR—Shell's latest offshore wildcat, No. 1 Hadet Shibeeb, is to be abandoned as a dry hole. Last summer Shell encountered oil shows in No. 2 Idd El Sharqi on another structure, to which it will return to drill the next test 1½ miles from No. 2.

SPAIN—In denial of the Spanish government's contention that their proposed facilities would duplicate those of competitive applicants already approved in Madrid, Standard of New Jersey and its Spanish partner Cia. Espanola de Petroleo SA (CESPA) have appealed the government's recent refusal to permit the two companies to form a $10 million petrochemical business in Spain. If government approval is finally obtained, the partnership will produce and market more than 24,000 tons per year of petrochemicals. Ultimate investment in the overall petrochemical industry in northern Spain could reach $26 million.

UGANDA—Caltex (Africa) Ltd., Nairobi, is setting up Caltex Oil (Uganda) Ltd., incorporated in Uganda, with headquarters at Kampala. Caltex has said it plans affiliates also in Tanganyika and Kenya.

USSR—Evidence indicates Russia will attain its goal of boosting its oil production to 4.8 million barrels daily by 1965 from 2.5 million in 1959, according to Theodore Shabad, French specialist on Russian affairs. By comparison, the USA produced 6.9 million barrels daily in 1959. "Russian production will outstrip its low per-capita consumption leaving a sizable surplus for export to the Free World," said Shabad, who estimates that 300,000 b/d of Russian oil goes to the western world, and this may hit 700,000 b/d by 1965.

USSR—More and more attention is turned in the Soviet Union to the drilling of deep wells. The presently deepest bore hole in the USSR, the 16,060-ft well No. 18 in the Syryan field (Azerbaidzhan), has been drilled like the other deep wells No. 8, 9, and 16 during an average 350 to 400 days and at a cost of 3.5 to 4 million rubles each. They were drilled with combined rotary and turbine installations. In comparison, the drilling in 1953 of the 15,788-ft rotary well took 677 days and cost 7.5 million rubles.

At present dozens of wells with a planned depth of 13,500 ft to 16,000 ft are drilling in the Syrya, Kenisadag, Myagchik, and Padar-Sucha fields. By the end of 1965, 400 such deep wells are to be drilled in Azerbaidzhan alone. From these wells, experience is to be gathered for the drilling of 22,900-ft to 32,800-ft wells. Latest reports from Moscow say that the first 22,900-ft well on the Eurasian continent is to be spudded in the pre-Caucasian desert where several salt domes suggest the presence of oil and gas.

According to A. Danielyan, director of the Baku Institute for the Construction of Drilling Units, the greatest obstacles in the construction of super-deep drilling units are high temperature and reservoir pressure. Experience has shown, Danielyan said, that temperature in a depth of 32,800 ft is about 752F to 932F, and well pressure about 14,223 psi. The drilling unit for a depth of 32,800 ft, presently under construction at the Institute for Deep Drilling Technique of the "Uralmashstroy" factory, will have a 187-ft-high derrick. The blowout preventer will be designed for pressures of up to 14,223 psi. The engine will have 3,500 hp; maximum load on the diamond drilling bit will be 100 to 110 tons. Total weight of the unit will be 300 tons, with auxiliary installations 500 tons.

USSR—By 1965, several underground gas-storage depots are to be built in the Soviet Union; among others, at Moscow, Leningrad, and Kiev, due to the satisfactory operation of the first underground gas reservoir at Kuybyshev. During the summer, gas is being pumped there into an abandoned gas field from where it flows under its own pressure to consumers during the winter.

USSR—Geological prospecting on the Ust-Urt plateau (Uzbekistan) has led to the discovery of the first oil- and gas-bearing deposits in this region. Each of the two anticlines discovered corresponds in size to the USSR's greatest gas deposit at Gazli, while the thickness of the horizons is even three times that of Gazli. Several deep wells have already been spudded in. The 80-square-mile Ust-Urt plateau, between Caspian Sea and Lake Aral, is an unpopulated, barren land with many salt marshes. Due to these natural difficulties, detailed geological research in this area had been postponed. It was not before last spring that the first geological team, equipped with caterpiller tractors, began prospecting in Ust-Urt.

USSR—The Soviet Union is likely to export about 25 million tons (500,000 b/d) of crude and products into Western countries during 1960, against 15 million during 1959, said Leo D. Welch (SONJ chairman) in Germany. He said this is sufficient to disturb the balance between supply and demand on Western markets, and could lead to price depressions.

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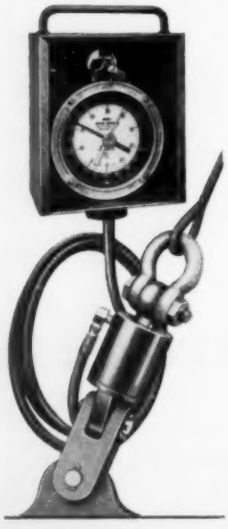

Where no deadline anchor is required, the MIDGET anchors the line with a heavy-duty, extremely rugged hydraulic cylinder and piston. The signal developed is transmitted to the gauge maintained near the hoist operator.

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BRANCHES AND AGENTS THROUGHOUT THE WORLD

OIL COMPANY STAFF CHANGES

R. O. Rhoades

W. K. Whiteford

E. D. Brockett

C. F. Ebsen

W. K. WHITEFORD, president of Gulf Oil Corp. since 1953, has been elected chairman, succeeding **RALPH O. RHOADES,** who recently reached retirement age. Mr. Whiteford will continue as chief executive officer and Mr. Rhoades will remain on the board. **E. D. BROCKETT,** formerly executive vice president, was elected president. Additionally, he will be vice chairman of the executive committee.

All actions were effective the end of October.

W. K. Whiteford has had a long and colorful career in the oil business that began in the early twenties when he was employed as a roustabout in the fields of southern California. Several years later, he joined the Barnsdall Oil Co. as a production engineer in the field and successively became general superintendent, vice president and general manager of Barnsdall's Mid-Continent Division. In 1935, he joined The British American Oil Co., Ltd. as executive vice president of its U. S. producing subsidiary, British American Oil Producing Co. Seven years later, Mr. Whiteford was elected executive vice president of British-American and transferred to its headquarters in Toronto. In 1943, he was elected president of B-A, and in 1951 was elected chairman. In October, 1951, he was elected a director and executive vice president of Gulf Oil Corp. In April, 1953, he was elected president and chief administrative officer of Gulf and in 1954, he was given the additional title of chief executive officer.

Second to W. L. Mellon, one of the company founders who was elected to the Presidency at the age of 41, Mr. Brockett is the youngest employee to be elevated to this position in Gulf. He is 47. A petroleum engineer by profession, Mr. Brockett joined Gulf in 1934. In 1952, Mr. Brockett was transferred to Caracas, Venezuela, where he served first as assistant to the president of Mene Grande Oil Co., a Gulf subsidiary, and later as manager of production operations in Eastern Venezuela. In January, 1955, he was elected a vice president of Gulf Oil Corp., and was placed in charge of the Houston Production Division. Two years later, he returned to Pittsburgh as coordinator of production on a world-wide basis. On January 1, 1960, he was named Gulf executive vice president. Later that same month, he was elected a director of the corporation and a member of the executive committee.

SAM W. LEONARD, Cairo, Egypt, has been promoted to the newly created position of manager of personnel relations for Continental Oil Co.'s international operations. Formerly administrative manager of Sahara Petroleum Co., a subsidiary of Continental Oil Co., he will make his new headquarters in New York.

ARTURO SABATO has resigned as executive director of Yacimientos Petroliferos Fiscales (YPF) in Argentina. He is associated with the liberal international oil policy of the Frondizi government and was its chief instigator. His resignation follows a recent military crisis which President Frondizi recently rode out, generally considered to have been a clash over the YPF oil policy.

HERBERT F. BEARDMORE, 56, has been elected a vice president of Gulf Oil Corp. He will be in charge of production operations in the U. S. with headquarters at Houston. Mr. Beardmore succeeds **ROBERT L. BOGGS,** who has announced his retirement from Gulf after 33 years of service, 22 of which were spent in foreign operations.

VINCENT R. D'ALESSANDRO has been named director of industrial relations for Sinclair Oil Corp. In his new position, D'Alessandro assumes responsibility for all functions relating to the handling of union relations of the Sinclair Companies.

BERNARD J. HEIART, Jr., aide to seven of Esso's eight presidents, has retired with 44½ years' service. Mr. Heiart was 18 when he joined Standard Oil Co. (N. J.) at the Bayway Refinery in Linden, N. J. He served with William Naden while he was president and executive vice president of Esso. He was also an aide to former Esso Presidents Frank W. Abrams, Chester F. Smith, Monroe J. Rathbone and O. V. Tracy; and the incumbent president, William W. Bryan.

J. S. ROYDS has been appointed vice president and exploration manager for the Continental Oil Co.'s foreign exploration and production department, with headquarters at New York City. **W. O. HAM, Jr.,** was appointed general manager of the domestic exploration department, with headquarters in Houston, succeeding Mr. Royds. **HAROLD R. PRESCOT** was promoted to the newly created position of assistant manager, domestic exploration department. He will continue to make his headquarters in Houston.

GEORGE F. KUHN, administrative assistant to T. B. Kimball, executive vice president operations of Sinclair Oil Corp., has been elected to the board of Sinclair and BP Sales, Inc. Sinclair and BP Sales, Inc. is jointly owned by Sinclair and British Petroleum.

CHARLES M. CUTBIRTH has been appointed plant manager of the Amarillo, Texas, refinery of Texaco Inc. He succeeds **JOHN R. CUTLER,** who has been promoted to supervisor of the department's expense control division at Houston.

DENIS A. HAYSE-GREGSON has been appointed general superintendent of drilling and production for the Texaco Exploration Co., a wholly-owned subsidiary of Texaco Inc. Mr. Hayse-Gregson has been transferred to the operating headquarters of the Texaco Exploration Co. at Calgary, Alberta, Canada, from his former position as superintendent of field operations for Texaco Trinidad, Inc. He had been with the latter company, which is also a wholly-owned subsidiary of Texaco Inc., since 1946 when he started as a junior production engineer.

CHARLES J. RELLER, treasurer of The Atlantic Refining Co. has been elected to the additional post of secretary of the firm. He succeeds **RICHARD RELLINS** who is retiring.

ROY J. DIWOKY, president, Commonwealth Oil Refining Co., Inc., has been elected to the newly-created position of chairman of the board of directors, and **SAM H. CASEY,** executive vice president, was named to succeed him as president and chief executive officer. No successor to Mr. Casey was named.

R. J. Diwoky

S. H. Casey

HUGH M. KEELEY has been named manager of Mobil International's distribution planning programs unit. **CHARLES N. MARAVELL** replaces Mr. Keeley as regional assistant in New York for West African and southwestern European operations of Mobil International. Mr. Keeley joined Mobil in 1947. He held senior posts with Mobil affiliates in Turkey, Greece, Nigeria, Ghana and Venezuela before coming to New York in 1958 as advisor on marketing operations.

JAMES E. WHITE, from former supervisor of physics at Ohio Oil Co.'s research center in Denver, to research associate on the staff of the research director, Dr. W. J. Yost. He is succeeded by **ROBERT B. RICE,** former senior research scientist.

CHARLES F. EBSEN has been appointed general sales manager, Foster Wheeler Corp. Formerly manager of process plants sales, he has served in varied sales capacities for the past eleven years.

GERALD J. DOYLE has been appointed administrative assistant to Millard E. Stone, vice president in charge of employee and community relations for Sinclair Oil Corp. and its subsidiaries. Mr. Doyle will handle special projects related to the enlarged employee and community relations program, which Sinclair recently announced.

W. O. HAM, Jr., Houston, and **H. F. NABORS,** New York City, have been elected as vice presidents of Continental Oil Co. Mr. Ham, who will continue to make his headquarters in Houston, is general manager of the company's domestic exploration department. Mr. Nabors is production manager for the foreign exploration and production department. He will continue to make his headquarters in New York City.

Mr. Ham joined Conoco in 1943 and became regional geologist at Fort Worth in 1952. He was promoted in 1959 to southwestern region general manager, and recently returned to Houston as general manager of the domestic exploration department.

Mr. Nabors joined Conoco in 1935 and has served as assistant production manager and production manager for the company's southern region, assistant general manager and general manager of the central region. He became production manager for the foreign exploration and production department early in 1960.

JOHN E. GROSS has been appointed regional executive of Mobil International Oil Co. for the Middle East. He will be responsible for administering com-

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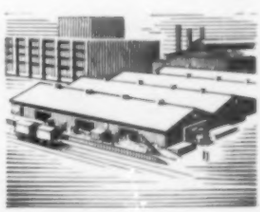

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Oil Company Staff Changes

(*Continued from page* 102)

pany interests in Iraq Petroleum Company, the Iranian Consortium, and Kuwait. Mr. Gross started with the company as an attorney in 1953. He became administrative assistant to the president of Mobil International in 1959.

SEWARD J. KENNEDY has been appointed regional assistant of Mobil International Oil Co. for Northern and Southeastern Europe. He joined the company's office as general counsel in 1955. Formerly, he was with the New York law firm of Davies, Hardy and Schenck.

KENNETH F. MURCHISON has been appointed manager, and **JOHN ANTONETZ** chief engineer of the marine sales and bunkering services division of Texaco Inc. Mr. Murchison, formerly assistant manager, succeeds Durrett Hendrix, who is now on special assignment. Mr. Antonetz, who was promoted from marine engineer, succeeds Albert C. Lanteri, retired.

WILLIAM F. LYTE

William F. Lyte, 59, vice president of Douglas Oil Co. of California and general manager of United Asphalt Co., died of a heart attack, October 9, while travelling in Europe. He was a resident of San Marino. He had been with Douglas Oil for the past 13 years.

UOP Forms New Subsidiary

Universal Oil Products Co. has formed a subsidiary with offices in Los Angeles to establish operations for marketing "Purzaust," the new UOP catalytic muffler for automotive vehicles to aid in smog control.

Universal Oxidation Processes, Inc., with an office at 811 West Seventh Street, will "handle the manufacturing and marketing of Purzaust upon its certification by the State Motor Vehicle Pollution Control Board," M. P. Venema, president of the parent company said.

Dresser Electronic Organization

The formation of a new division of Dresser Industries, Inc., that will give better identification to the company's expanding importance in the electronics industry, has been announced by H. N. Mallon, chairman.

The new division, which is to be called Dresser Electronics, will include all the activity in the electronics field of two Dresser subsidiaries, Southwestern Industrial Electronics Co., Houston, Texas, and Hermetic Seal Transformer division, Garland, Texas. The names of these two companies will be modified to show their new relationship as divisions of Dresser Electronics.

Southwestern Industrial Electronics Co., which began in business in 1945, will now be known as Dresser Electronics, SIE Division, with George Peck continuing as its president.

Hermetic Seal Transformer Co., organized in 1952, will now become Dresser Electronics, HST Division, with Peter L. Scott, founder and top officer of the original company, continuing as president.

"The formation of Dresser Electronics will enable Dresser Industries to provide a more unified identification in the rapidly growing electronics industry. The over-all marketing areas for the new division will combine all the activities of both SIE and HST Divisions," Mr. Mallon stated.

Valchuk to BJ's Holland Plant

Bryon Jackson has appointed Alexander Valchuk managing director of the company's manufacturing plant in the Netherlands. Mr. Valchuk will succeed Earl M. Rees, who has directed plant operations since 1959. Known as Byron Jackson N.V., this wholly-owned company subsidiary is currently manufacturing certain BJ oil tools for the export market.

New International Oil Map Series

A new series of geological and concession maps covering all countries of Africa and the Middle East has been issued. In a single large volume, with 60 geological overlays, it contains 115 pages of base maps. They are well drawn and make a valuable addition to oil libraries, especially for exploration purposes. Compiled by A. H. Munger, it is available from him at 5865 West Boulevard, Los Angeles 43, California. Price is $40 per copy.

Tests Turbine Frac Unit

The Halliburton Co. has completed a field frac test of its new turbine-powered unit in the Santa Fe field, Stephens County, Okla. Powered by a 900-hp General Electric gas turbine the Halliburton unit pumped 18,000 gallons of water and 20,000 pounds of sand at a maximum injection rate of 27½ bbl per min and pressure of 1,750 psi. Laboratory tests of the new gas turbine unit have been in progress since June.

Oliphant Addresses Nomads

Ten international guests were present at the October meeting of the Houston Chapter of NOMADS to hear Sam Oliphant, Tennessee Gas and Oil Co., describe drilling activities of his company at Tierra Del Fuego, Argentina. Pictured with the speaker are, left to right, Heinz Lettner, D.E.A., Germany; Roy Allen, British American Oil Co., Calgary, Alberta; N. B. Biggerstaff, National Supply Co., Mexico City; Harold Devenish, Trinidad Oil Field Service, Trinidad; Sam Oliphant, speaker; H. L. Olson, Pan American International Oil Co., Iran; Siegfried Thomas, D.E.A., Hanover, Germany; R. Caron, Cameron Iron Works, Paris, France; and A. R. Prell, Mene Grande Oil Co., Maracaibo, Venezuela. Present but not pictured were Alberto Giannetti, Y.P.F., and Manuel Lessa, Y.P.F., both of Buenos Aires.

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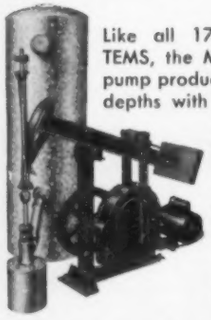

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			20-40 Press.	Open Disc.	20-40 Press	Open Disc.
1⅜"	1¼"	150	330'	420'	480'	510'
1⅞"	2"	280	135'	225'	250'	340'
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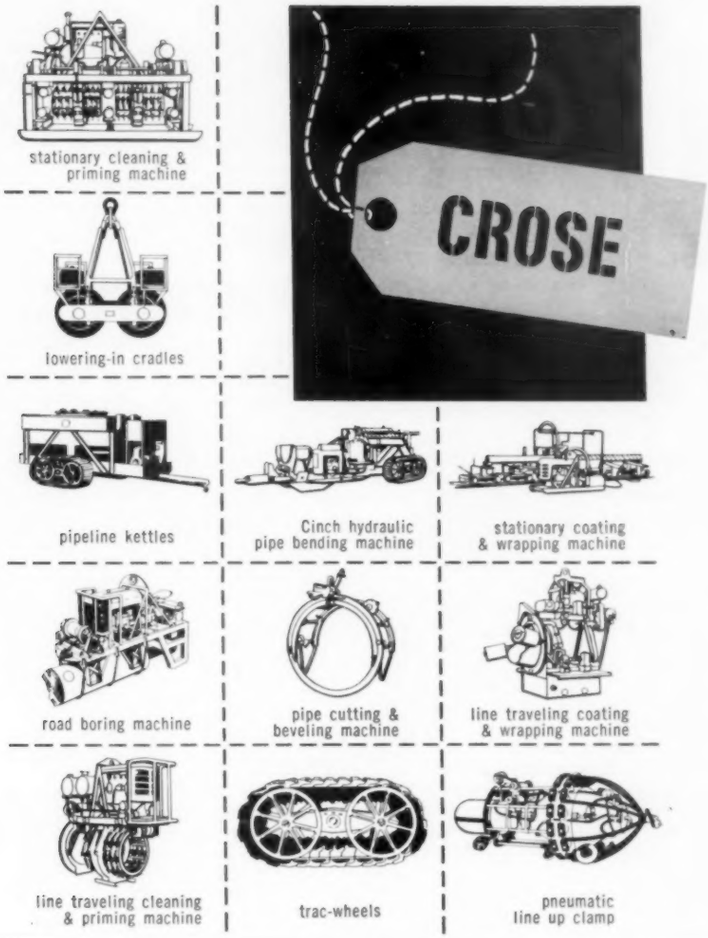

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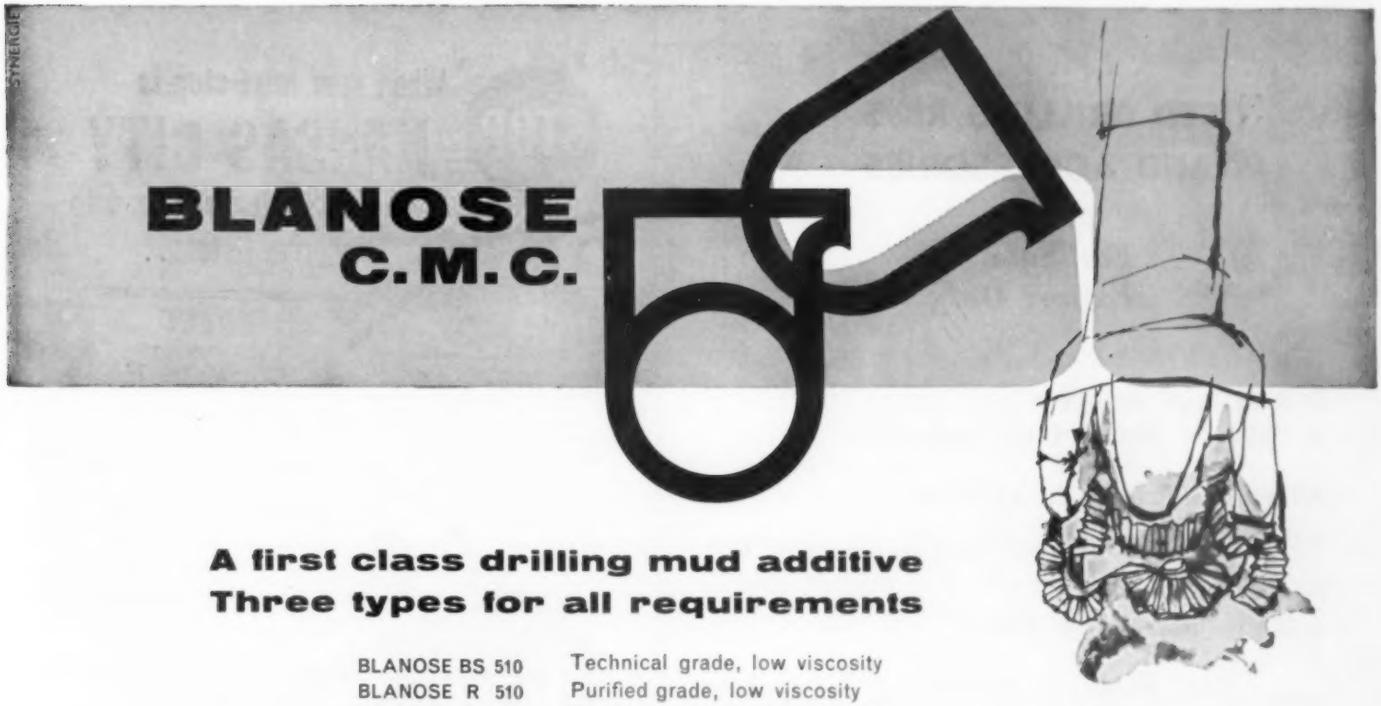

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J. R. Lesch

J. Z. Brewer

A. G. Davis

W. A. Kistler

Hughes Sales Changes

James R. Lesch has been appointed to the newly created post of general product manager of Hughes Tool Co. Formerly product manager, rock bits, he will now head up a staff responsible for reviewing and co-ordinating marketing programs, evaluating and controlling product change requests, and finished inventory planning for all Hughes products.

Assisting Mr. Lesch are J. Z. Brewer, manager, product co-ordination; A. G. Davis, manager, distribution inventory planning, and W. A. Kistler, Jr., product manager, rock bits, the position formerly held by Lesch.

Mr. Brewer will co-ordinate the product change activities of the engineering, manufacturing and sales departments. Mr. Davis will be responsible for forecasting production requirements for the world-wide drilling industry, maintaining finished product inventories, and the authorization of final product assemblies.

Mr. Kistler will be responsible for recommendations about composition and control of the Hughes product line and plan the introduction of new items.

Swearingen Sees Oil Hope

The oil industry has ahead of it "an energy market of staggering proportions," if it will learn to live with "a major problems of its own making," John E. Swearingen, president of Standard Oil Co. (Indiana), has told the National Petroleum Association.

The industry's future—in terms of ultimate possibilities—looks no less bright than its past," Mr. Swearingen said. A tremendous population explosion in all parts of the world, rising standards of living and accelerating industrialization of the less developed countries, and a technologically-based society will contribute to tomorrow's energy market, he added.

However, he declared, "the petroleum industry's major problem has been of its own making. Like someone affected with a glandular disorder, it can't stop expanding. Its growth mechanism continues to grind relentlessly on without waiting for demand to catch up. It is anticipating opportunities that were used up yesterday. In the process, it has created a tremendous investment in facilities that currently cannot operate at a sufficiently high level to generate a satisfactory return, and it has created product surpluses that hang as constant threats over the industry's price structure."

Mr. Swearingen suggested three positive actions for advancing the petroleum industry: 1. Adjustment of operations to present realities. 2. A slowing down of new additions to capacity so that demand can catch up. 3. A stimulus to demand by all available means, creating new markets rather than waiting patiently for them to develop.

Mr. Swearingen said people generally have "very favorable attitudes toward our industry on the basis of past performance," in spite of a lingering image of the old-time Texas oilman with a 10-gallon hat. The average consumer's "understanding of history may be faulty, but he has some sense of the constructive achievement of an industry that has provided mankind with more energy in its first 100 years than mankind was able to use in all its preceding centuries," he added. "Our average customer no longer worries about coal scuttles and ashes in heating his home; he rides in automobiles, trains, and airplanes powered with oil."

Capital Investments Rise

Combined capital expenditures in the Free World petroleum industry totaled an estimated $11.2 billion in 1959 compared with $10.7 billion in 1958, according to "Capital Investments by the World Petroleum Industry," published by The Chase Manhattan Bank. The report was prepared by Frederick G. Coqueron, petroleum analyst of the bank's petroleum department.

During the ten-year period 1950-1959, the outlay for replacement and expansion of property, plant and equipment by the Free World petroleum industry aggregated $84 billion, of which $50 billion—or 60% was made in the U.S., and $34 billion—or 40%—for facilities in other areas, the report indicated.

Crude oil production, refinery throughput and petroleum consumption in the Free World increased twofold between 1949 and 1959, the survey said, while gross investment in fixed assets expanded 2.8 times.

As a result of the funds disbursed during this decade, the gross investment in fixed assets employed by the industry grew from $34.6 billion at the end of 1949 to $97.3 billion at the close of 1959. Of the latter amount, the report said $54.7 billion—or 56% —was located in the U.S. and $42.6 billion in other areas.

Of the total investment of $42.6 billion in fixed assets located abroad, the Chase Manhattan survey said American oil companies contributed $16 billion. Allocation of their participation by areas was: Canada 59 per cent, Venezuela 64 per cent, Western Europe 24 per cent, Middle East 47 per cent, and other countries 27 per cent.

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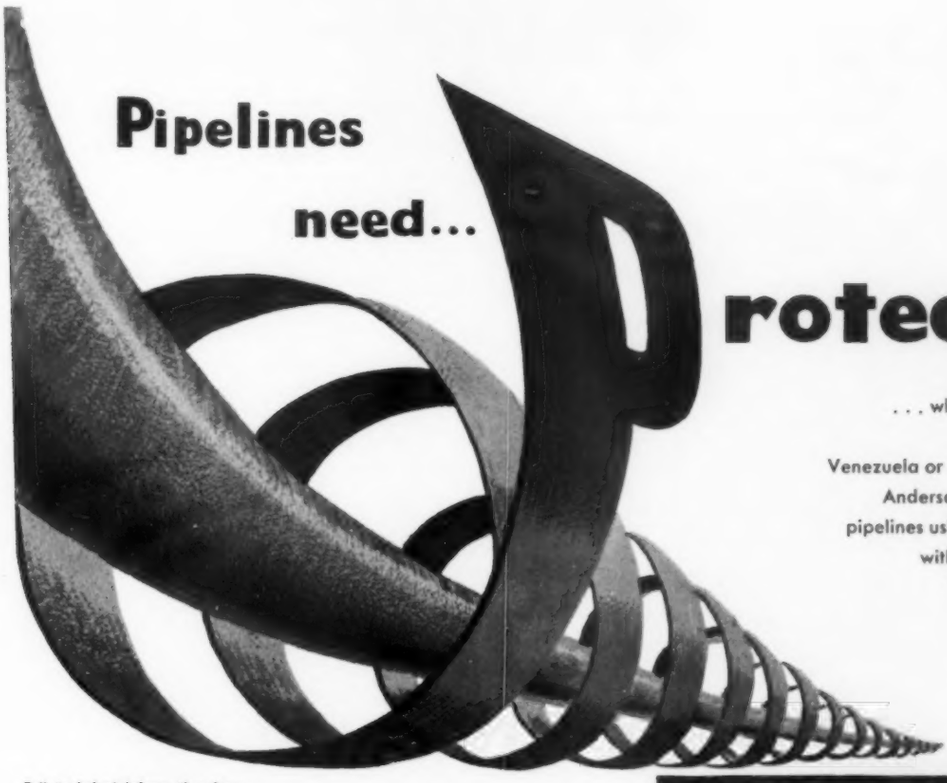

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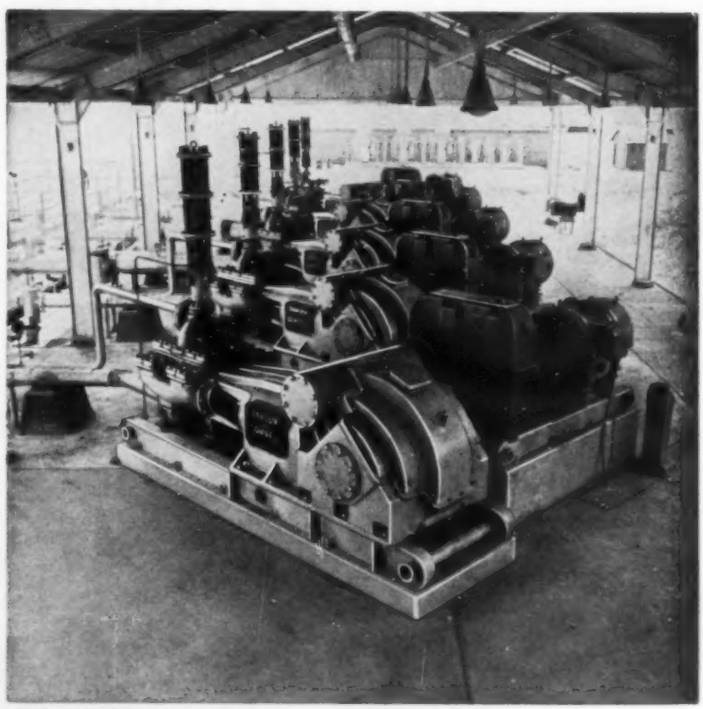

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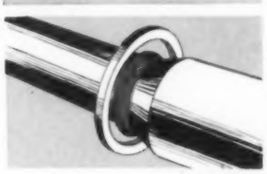

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